

AN ANALYSIS OF THE EFFECTS OF PREREFERRAL  
INTERVENTIONS ON THE REDUCTION OF  
INAPPROPRIATE CLASSROOM BEHAVIORS

A Dissertation  
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by Gerald L. Stremel  
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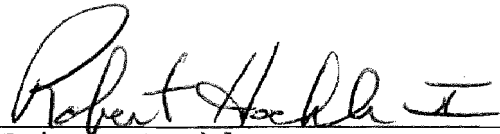
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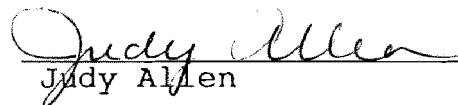
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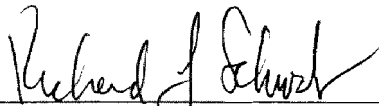
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AN ANALYSIS OF THE EFFECTS OF PREREFERRAL  
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An abstract of a Dissertation by  
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June 1995  
Advisor: Marion Panyan

The problem. The author identified a number of concerns with traditional special education services which suggest the need to investigate different methods of remediating student problems within the mainstream classroom environment. These included: (a) the educational community's failure to meet the intent of P.L. 94-142, (b) an increasing number of individuals with mild disabilities, (c) the high cost of special education, (d) the lack of objectivity in determining which students are eligible for special education, and (e) the general ineffectiveness of special education instructional services. The purpose of this study was to determine whether consultants using the Mainstream Assessment Team: A Handbook on Prereferral Intervention (MAT) (Fuchs, Fuchs, Reeder, Gilman, Fernstrom, Bahr, & Moore, 1989) as an operational tool, could successfully assist classroom teachers in reducing inappropriate behaviors of students being considered for special education evaluation.

Procedures. Three school psychologists (serving as consultants) received abbreviated instruction in all phases of the MAT. Working with regular education teachers from three different elementary schools, the consultants used MAT techniques in intervening with 14 different students under consideration for special education referral.

Findings. Compared to gender-matched peers, who served as comparison students, the 14 target students demonstrated a significant reduction in inappropriate behavior, indicating that the MAT can be an effective tool in reducing inappropriate behavior in the mainstream classroom environment.

Conclusions. While the MAT proved successful in reducing inappropriate behaviors, additional efforts are necessary to validate its utility as an operational treatment methodology. Specifically, more work is needed in: (a) understanding the dynamics in selecting and training consultants, (b) identifying the types of problems treatable by the MAT, (c) broadening sample sizes and constructing longitudinal studies to strengthen external validity, and (d) socially validating the MAT as a treatment intervention.

While this study demonstrated the potential of the MAT as an effective classroom intervention method, until these issues are addressed, its overall usefulness and generalizability in remediating problems without relying on special education services is indeterminable.

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## Chapter 1

### INTRODUCTION

In 1975 the United States Congress passed the Education of All Handicapped Children Act (EHA). More commonly known as PL 94-142, the act legislated that all children with disabilities be provided a free and appropriate public education in the least restrictive environment and that the rights of children with disabilities and their parents be protected. It required that states receiving federal funds implement a set of procedures to ensure the identification and treatment of children experiencing developmental delays categorized in the areas of: (a) deaf-blindness, (b) deafness, (c) hearing impaired, (d) mentally retarded, (e) multiply disabled, (f) orthopedically impaired, (g) other health impaired, (h) learning disabled (LD), (i) seriously emotionally disturbed (SED), (j) speech or language impaired; and (k) visually impaired. PL 94-142 was reauthorized in 1992 as the Individuals With Disabilities Education Act (IDEA), at which time the disability areas of autism and traumatic brain injury were added as mandatory service categories.

Since its inception, PL 94-142 has created questions and controversy within the educational community regarding which students are eligible for special education services

and the efficacy of different program models for providing the most beneficial instructional services. In this chapter, it will be argued that:

1. The educational community has failed to meet the specific intent of the PL 94-142 by over identifying the number of students eligible for special education services.
2. The costs of providing special education services to individuals with mild disabilities; i.e., those students receiving the majority of instruction within the regular classroom (primarily individuals with learning disabilities, or emotional or behavioral disorders) are excessive.
3. There is an empirical base which generates convincing evidence that public educators are generally incapable and/or unwilling to objectify the process for determining which students are eligible for services.
4. Existing special education pull-out service models have been relatively ineffective in remediating educational problems for students with mild disabilities.
5. Methods need to be developed which will refocus instructional efforts at remediation away from special education services and back to the general educational environment.

Specific Intent of PL 94-142

In February of 1981 the Comptroller General of the United States issued a report which reviewed the intent of Congress in drafting PL 94-142 (Comptroller General of the United States, 1981). Citing specific comments within the legislation, the Comptroller General noted that the definition of eligibility clearly refers only to children whose disabilities require special education and related services and not to children whose learning problems are caused by environmental, cultural or economic disadvantages, or to children who may be slow learners. The Comptroller General instructed the states that their principal service objectives should be directed at assisting those children who are the most severely handicapped. It was clearly indicated that the Congressional intent of the legislation was to provide special education and related services to a very discrete and limited population, rather than to encompass the more broad and dynamic concept of exceptionality acknowledged by some educators, parents, and advocacy groups.

While the Congressional intent of providing special education services to those children with the most severe handicaps is apparent, the most notable increases in special education programs have, nonetheless, occurred in categories of mild exceptionalities (i.e., specific learning

disabilities (LD) and students with serious emotional disturbances). By 1984, the number of children with learning disabilities represented 4.3% of the school age enrollment and more than 40% of all children receiving special education services. This represented an increase of 119% in the seven-year period since full implementation of the legislation (U.S. Department of Education, 1984). Dramatic population increases also were evident in individuals receiving special education services under the category of seriously emotionally disturbed. During the same period, these children grew in total numbers by 25%. These figures are particularly notable because the increases occurred at a time when the nation experienced a steady decline in the school age population.

Because of the rapid growth in the number of students receiving special education services, in the early 1980s many states began to take steps to curtail further expansion through the development of discrepancy formulas designed to limit funding for LD programs. While these efforts had a positive effect in slowing the increasing population rate of students with learning disabilities, the number of students receiving services still increased by 9.6% between 1983 and 1986 (Singer & Butler, 1987). By 1986 the LD population represented 43.1% of the overall special education population. This expansion can be further illustrated by comparing absolute numbers of students served in 1977 with

those served in 1986. In 1977 approximately 800,000 students were identified as LD, which represented only 22% of the overall special education enrollment. By 1986 the number had risen to 1.9 million. In 1977 the students with learning disabilities represented 1.8% of the general enrollment. By 1986 they represented 4.7% of the overall student body.

Similar patterns are evident in the population of individuals with serious emotional disturbances (SED). Between 1983 and 1986 the number of students receiving special education services through SED programs increased by 3.8% with overall expansion since 1977 of 32.8%. By 1986, students with serious emotional disturbances represented 8.7% of the overall special education enrollment.

By 1986, just nine years after implementation of IDEA, the combined incidences of students with LD and SED represented a growth rate in excess of 100%. During this same period, the overall number of students receiving special education services actually decreased by 10.8% (Singer & Butler, 1987). While the pace has slowed since 1986, the number of students receiving special education services continues to grow. Between 1986 and 1990 the special education population increased at a rate of 1.2% to 2.2% annually (U.S. Department of Education, 1991), the vast majority of which occurred in the categories of individuals with mild disabilities.

### Special Education Cost Analysis

From a fiscal perspective, the continued growth of LD and SED populations is very disconcerting. In an analysis of special education costs, Chaikind, Danielson, and Brauen (1993) determined that, on a national level, the average per pupil expenditure for special education services was approximately \$7,800 in 1989-90 dollars, or about 2.3 times the cost of regular education. Their figures were based on data from the 1985-86 school year adjusted for an inflationary rate of 16.8% for the three-year period between 1985-86 and 1989-90 (Consumer Price Index - Labor Department's Bureau of Labor Statistics) and a presumed real annual growth of 1.25%. In constant 1989-90 dollars, this represents an excess per pupil cost for special education of \$4,153 beyond the average cost per pupil for nonspecial education students, which was determined at \$3,247. Otherwise stated, Chaikind, Danielson, and Brauen (1993) computed the per pupil cost for special education services by adding the regular education per pupil cost of \$3,247 and the excess per pupil cost of \$4,153 which resulted in a per pupil expenditure of \$7,800 for special education services.

Chaikind et al. further reported that the ratio of the average per pupil cost for special education to the average per pupil cost for regular education has consistently remained at about 2:1 over the past 20 years. Even given this stability, special education services continue to

capture ever-increasing percentages of the overall school budget. This can most reasonably be explained by the remarkable increases in the number students with learning disabilities and serious emotional disturbances; that is, the higher total percentage of students receiving special education services has resulted in greater overall expenditures despite the steadfast nature of the 2:1 ratio of special education to regular education expenses. As the number of special education students increase, so too must the proportion of the expenditures relative to the overall educational budget.

It is also apparent from Chaikind et al.'s data that more restrictive educational alternatives, (e.g., residential placements), which on a per pupil basis average \$34,456 per year are far more costly than less restrictive alternatives, such as resource room placements which average \$6,124 per pupil per year, or self-contained classrooms with an average annual per pupil expenditure of \$8,075. Given that the number of special education students in categories other than LD and SED actually have declined, and given that most students with learning disabilities and serious emotional disturbances typically are placed in less restrictive rather than more restrictive environments, it would seem as though the ratio of special education to regular education costs should decrease. Quite simply, it costs much less to educate a student with a mild disability

than it does to educate a student with a severe disability. With fewer students identified as severely disabled and more students identified as mildly disabled, why then has the ratio of special education to regular education expenditures remained stable over the years when it should have decreased?

While it is reasonable to presume that the greater number of students requiring LD and SED special education services should result in the need for a larger proportion of the overall educational budget, it is also reasonable to presume that the 2.3:1 cost ratio should decline rather than remain stable or increase as it has since the implementation of the PL 94-142. This suggests that not only have the increases in the number of students with learning disabilities and serious emotional disturbances resulted in much greater absolute costs, they have also resulted in greater proportional costs than before implementation of PL 94-142.

It is also noteworthy that the special education per pupil costs enumerated by Chaikind et al. (1993) do not account for screening and assessment activities. Chaikind et al. conservatively estimated these figures at \$1,206 per incidence in 1985-86 dollars. By applying the same inflationary ratio of 16.8% and assuming real annual growth of 1.25%, that figure rises to \$1,462 in constant 1989-90 dollars. Another researcher, Howell (1988) estimated that



on a national level during the 1986-87 school year, assessment activities ranged from \$2,000 to \$5,000 per incidence, regardless of whether or not the student assessed was found eligible for special education services. Applying the same inflationary analysis and accounting for the same rate of real growth as Chaikind et al., Howell's estimates rise to an inclusive range of \$2,814 to \$7,036 per assessment in constant 1989-90 dollars.

#### Identification and Eligibility Determination

As early as 1981, researchers began to question the assessment and corresponding decision-making processes which resulted in students being declared eligible for special education services. Ysseldyke, Algozzine, Regan, and McGue (1981) conducted an investigation to determine the extent to which the assessment process differs as a function of the presenting referral information, and the extent to which naturally occurring pupil characteristics, (e.g., gender, socioeconomic status, and physical appearance) bias eligibility decisions. Through use of a computer simulation, they presented a student case portfolio to 159 educators and school psychologists in the state of Minnesota. The portfolio included information and scores in the areas of intelligence, achievement, perceptual-motor abilities, personality, language development, and behavior, with information across all domains consistently reflecting

student performance within the average range. All participants received identical test information. Subjects also received information on the student's sex, socioeconomic status, type of referral problem, and physical attractiveness which varied through random assignment to treatment conditions.

While the referred student's sex, socioeconomic status, and physical appearance had no effect on diagnostic outcomes, the reasons for referral significantly affected eligibility decisions. Treatment conditions in which referrals suggested the possibility of student behavioral problems resulted in a significantly greater likelihood that the student would be rated as seriously emotionally disturbed than when the presenting problem primarily raised questions about academic skills. Correspondingly, when the referral was academic in nature, students were rated as having greater potential for learning problems.

It is noteworthy that, while the decision makers reported a heavy reliance on test data, the same test information resulted in a divergence of opinion regarding diagnosis. Contrary to the perceptions of the participants, the researchers concluded that the nature of the referral was the strongest predictor of diagnostic outcome. Even when objective test data indicated average functioning, when presented a referral problem suggesting learning or behavioral problems, subjects found pathology within the

student, thus suggesting that the evaluation procedure is little more than a confirmative process of teacher concerns.

In a related study, Algozzine and Ysseldyke (1981) presented diagnostic information to another 224 educational professionals in the state of Minnesota. Respondents included regular education teachers, special education teachers, administrators, school psychologists, and various other support personnel (e.g., school nurses and school social workers). While subjects were allowed to manipulate choice of test instrumentation through a computer simulation process, all results were programmed to consistently provide data reflecting test results within the average range. Approximately 51% of the respondents determined that the referred student was eligible for special education. Eight subjects identified the student as mentally retarded, 103 decided the student was learning disabled, and 48 said the child had an emotional disturbance. Twenty of the respondents believed the student should be placed in special education on a full-time basis.

Algozzine, Christenson, and Ysseldyke (1982) surveyed a nation-wide random sample of special education directors regarding student referral, testing, and special education placement patterns. Their results indicated that 92% of the students referred for special education consideration were evaluated, and of those, 73% were placed in special education programs. These figures are alarming given that 5%

of the elementary age student population are referred on an annual basis (Algozzine, Ysseldyke, & Christenson, 1983). Citing the earlier work of Ysseldyke and Algozzine (1982), in which the authors concluded that we have developed a "massive system of identification" (Algozzine et al., 1982, p. 19) in order to accommodate an increasing lack of tolerance of differences, Algozzine et al. (1982) attributed their findings to teacher preparation programs which emphasize that referrals for psychoeducational evaluations are the most appropriate step to take for students who deviate from classroom expectations. They interpret their data to suggest that psychoeducational assessments are primarily political and only serve the purpose of creating homogenous classroom environments. They suggest that teacher preparation programs should refocus instruction to more heavily emphasize the development of teacher intervention skills.

Other researchers (Ysseldyke, Pianta, Christenson, Wang, & Algozzine, 1983; Ysseldyke & Thurlow, 1984) argue that, while teachers refer students for a variety of learning and/or behaviorally manifested symptoms, they consistently indicate that they desire placement in special education as the primary outcome of the assessment. This is demonstrated by the uniformity with which students are placed in the special education category for which they are referred. In a review of 258 students, Foster, Ysseldyke,

Casey, and Thurlow (1984) identified a correlation of .88 between referral category and placement decision. Their data suggested that, in general, if a student is not placed in the category of referral, the student is not served through a special education program. They also found that when principals initiated the referral, the student was placed in the category for which referred 100% of the time.

#### Ineffectiveness of Pull-out Programs

Carlberg and Kavale (1980) undertook an extensive review of the literature in an attempt to answer the question of whether pull-out special education programs are more effective than regular class placements in remediating student learning and/or behavioral problems. They concluded that individual studies were too divergent in methodology and findings to be conclusive. They cited three explanations for the inconclusiveness of the research: (a) lack of treatment effect, which would make gains from either pull-out or regular class placements difficult to detect; (b) a sufficient lack of power to detect differences; and (c) lack of random assignment in the examined studies.

Because of the inconclusiveness of the examined studies, they applied a meta-analytic technique which examined 50 studies that met all of the following criteria: (a) investigation of educational placement for an identifiable category of exceptionality, (b) examination of

a special class placement, (c) inclusion of a comparison group, and (d) report of results in a fashion which could be appropriately adapted to meta-analysis. The scope of the data represented approximately 27,000 special and regular class students, who averaged 11 years of age, with a mean IQ of 74.

Because most of the studies used multiple outcome measures with more than one comparison, the meta-analysis yielded a total of 322 effect sizes. The researchers identified an overall effect size of  $-.12$  of pull-out programs (independent variable) on the combined dependent variables of: (a) academic achievement, (b) social development, and (c) other. This indicated that students in special classes scored approximately one-tenth of a standard deviation below students in regular class placements. Otherwise stated, "the average subject in a special class stands at approximately the 45th percentile of subjects in a regular class" (Carlberg & Kavale, 1980, p. 300). When the dependent measures were disaggregated, the effect size on academic achievement for pull-out programs was  $-.15$  and the effect size on social development for pull-out programs was  $-.11$ .

In the aggregate, 58% of the effect sizes were negative. In more than half of the cases, pull-out programs appeared less effective than regular class placements. Carlberg and Kavale concluded that the assumption that

"students in special classes were no worse off than if they had remained in regular classes is apparently incorrect" (p. 300).

#### Refocus of Instructional Efforts

During her tenure as Assistant Secretary for the Office of Special Education and Rehabilitative Services for the U.S. Department of Education, Will (1986) noted that the "singular challenge facing education today is the challenge of providing the best, most effective education possible for children and youth with learning problems" (p. 411). She argued that the prevailing presumption that students with special learning needs cannot be effectively taught in regular education has led to the creation of pull-out programs for special education services. However well intended, Will argued that pull-out programs oftentimes fail to meet the educational needs of the very students they intend to benefit and in fact create barriers to their successful education. She noted that special programming works against the formation of coherent service delivery strategies and focuses on student failures rather than successes. Because of the focus on failure and the compartmentalization of special education services, many children in need of help are not eligible for assistance and therefore cannot access the resources required for their success. The lack of preventative services, in turn,

ultimately leads to educational failure and the ever increasing need for special education assistance. She further noted a prevailing belief that regular education has little responsibility and/or expertise to help children with learning problems, and more importantly, little incentive to do so. As noted by Ysseldyke and Algozzine (1982), special education has created an ever-increasing system of homogenous classroom environments where a lack of tolerance for individual differences is a prime predictor of the lack of student success.

Will (1986) noted that the emerging challenge in meeting the needs of children with learning problems is to develop a support system for regular education which will refocus efforts on prevention. She believes that success in the regular classroom for both children with identified disabilities, and children otherwise classified as "at-risk" can be greatly enhanced by establishing support teams to: (a) informally assess learning problems, (b) assist the classroom teacher in creating regular education alternatives and solutions to instructional problems, and (c) provide classroom support via the use of team teaching strategies and through the use of paraprofessional assistance.

Stainback and Stainback (1988) argued that we are at a time in history that we can no longer be satisfied with disparate educational systems with limited access to all, and no access to many. They believe that the current system



of labeling and classification of students is inefficient and ineffective in delivering necessary services, and that it drains personnel and monetary resources which could be redirected to creating more flexibility and adaptability in accommodating all learning needs within the classroom environment.

They argued that we must pursue the complete integration of special and regular education personnel, programs and resources to create a "unified, comprehensive regular education system capable of meeting the unique needs of all students in the mainstream of regular education" (Stainback & Stainback, 1988, p. 17). Like Will (1986), Stainback and Stainback offered the position that it is time to stop developing exclusionary systems which set criteria for who does, and who does not, belong in the mainstream. Instead, it is time to refocus efforts on increasing the capabilities of the regular mainstreamed school environment in meeting the unique needs of all students. Stainback and Stainback believe that educational systems should be restructured under the following assumptions: (a) all children deserve a free and appropriate education; (b) the education and related services any student receives should be based on his or her specific interests, needs, and capabilities; (c) all students should have their needs met as a regular or normal practice; and (d) all students should be educated in the same basic system of education.

Kerzner Lipsky and Gartner (1987) likewise took the position that educational efforts need to be redirected to be inclusive of all children. They contend that the appropriate education of students with disabilities cannot be achieved in a separate educational system, believing that a fundamental problem exists in our ever persisting assumption about the nature of our organizational systems and the characteristics of distinct learning groups. Special education was marketed as a particular body of expertise which was willing and capable of remediating difficult learning problems. The regular education community, whether due to skill deficits or to a lack of desire to work with challenging youngsters, was quite willing to turn the problem over to special education. They believe that only through the unification of the special and regular education systems can all students achieve total human dignity and an appropriate education. They argued that we must discontinue our efforts to perfect a separate, segregated system and redirect our resources to making general education more flexible and responsive to the educational needs of the full range of student abilities.

Reynolds, Wang, and Walberg (1987) argued that special education is fraught with proceduralism and disjointedness. It is a system which grew out of a series of narrowly framed programs which do not interact with one another. Unless significant programmatic changes occur, they predicted

increasing problems due to the increasing number of children living in poverty.

Contending that there is little evidence to justify the present practice of categorizing and removing children from the regular classroom, Reynolds et al. supported the efforts of others (Kerzner Lipsky & Gartner, 1987; Stainback & Stainback, 1988; Will, 1986) in proposing a system which would join the personnel and resources from special, compensatory, and regular education to establish an inclusive general education system for the good of all students. Other authors (Reynolds & Barlow, 1972; Wang & Reynolds, 1985; Wang, Rubenstein, & Reynolds, 1985) have likewise added support to the need to unify special and regular education into a singular system designed to prevent emerging educational problems from leading to student failure.

While agreeing with other authors about the need for a fundamental restructuring of existing special education systems, Hagerty and Abramson (1987) cautioned that many barriers exist to a complete systems overhaul. They noted that, because of the almost exclusive categorical nature of the existing special education funding systems, efforts to redirect resources to instruction and related service activities have been resisted by both the educational establishment and disability advocacy groups. There appears to be a prevailing fear that any new resource redistribution

system could jeopardize procedural safeguards and fiscal entitlements previously secured through legislative and judicial actions. In addition, teacher training programs are essentially categorical, as are state teacher licensure and certification bureaus. Hagerty and Abramson argued that restructuring of special education must be paralleled by redirected teacher preparation programs which refocus on prevention and student intervention within the classroom through a partnership between classroom teachers and resource support specialists.

They believe that reform efforts will meet with stiff resistance at the local level. Administrative bodies, parent advocacy groups, and regular classroom teachers will work to thwart the process as a natural response to the change process. Any change efforts must therefore be implemented in a manner which creates a receptive spirit among teachers at all levels within a system.

#### Statement of the Problem

Given the concerns with: (a) the educational community's failure to meet the intent of P.L. 94-142, (b) the increasing numbers of individuals with mild disabilities, (c) the high cost of special education, (d) the lack of objectivity in determining which students are eligible for special education, and (e) the general ineffectiveness of special education, it is important to

examine different methods of remediating educational problems within the mainstream classroom environment. Only through the empirical validation of the effectiveness of classroom intervention efforts will it be possible to construct effective classroom-based treatment models.

### Research Questions

An alternative to the traditional model of seeking child pathology and attempting remediation through special education programs is to offer consultative assistance in developing and implementing prereferral interventions at the classroom level. Numerous researchers (e.g., Bahr, Fuchs, Fuchs, Fernstrom, & Stecker, 1988; Carter & Sugai, 1989; Fuchs, 1991; Fuchs, Fuchs, & Bahr, 1990; Gresham, 1989; Witt, 1986; Ysseldyke et al., 1983) have suggested the use of classroom-based prereferral interventions as a model to reduce the number of students with mild disabilities placed in special education pull-out programs. However, research on the use and effectiveness of prereferral interventions is sparse and inconclusive. Most of the applied research can be categorized into four models: Teacher Assistance Teams (Chalfant, VanDusen Pysh, & Moultrie, 1979); Prevention-Intervention-Project (Cantrell & Cantrell, 1976); Prereferral Intervention Model (Graden, Casey, & Bonstrom, 1985; Ponti, Zins, & Graden, 1988); and the Mainstream

Assistance Team Model (Bahr et al., 1988; Fuchs, 1991; Fuchs & Fuchs, 1989; Fuchs et al., 1990).

All of the models have strikingly similar characteristics. They are designed to remediate problems without resorting to pull-out special education programs. They are preventative in nature and depend on the use of consultative-based services to assist mainstream teachers in devising, implementing, and measuring the effectiveness of classroom-based interventions.

While the research does not offer conclusive evidence that any of the models are consistently successful in achieving desired student outcomes, the Mainstream Assistance Team (MAT) model offers the greatest promise of fully realizing the potential of prereferral interventions. The MAT project demonstrated that consultative-based interventions, coupled with the use of student contingency contracts and data-based monitoring procedures could be successful in intervening with difficult-to-teach pupils directly in the classroom.

The authors of the MAT project believe that the success of prereferral interventions depends in part on highly structured activities by the consultant and classroom teacher. To this end, they authored a guide entitled, Mainstream Assistance Teams: A Handbook on Prereferral Intervention (Fuchs et al. & Moore, 1989), which offers promise for improving the quality of

prereferral interventions and correspondingly demonstrating that many student problems are treatable in the mainstream classroom setting. Specific application of the handbook, has not, however been empirically verified.

It was the intent of this project to further evaluate the effectiveness of the application of the behavioral principles contained within the Mainstream Assistance Teams: A Handbook on Prereferral Intervention, on remediating inappropriate student behavior in the mainstreamed classroom environment. Specifically, an attempt was made to answer the following questions: (a) does the level of inappropriate behavior of students being considered for special education evaluation (target students) differ from the level of inappropriate behavior of other students in the classroom, and (b) will the level of inappropriate behavior of target students decrease from baseline measures as a function of more effective prereferral interventions? The following hypotheses were tested: (a) the level of inappropriate behavior of students being considered for special education evaluation (target students) would be greater than the level of inappropriate behavior of other students in the same classroom at pre-intervention, (b) the level of inappropriate behavior of target students would be the same as the level of inappropriate behavior of other students at post-intervention, and (c) the level of inappropriate

behavior of target students would decrease as a function of prereferral interventions.



## Chapter 2

### REVIEW OF THE LITERATURE

#### Introduction

In the previous chapter it was argued that the educational community needs to refocus instructional efforts at the remediation of student concerns within the regular education classroom, instead of continuing to rely on special education pull-out services for individuals with mild disabilities. Since it is reasonable to assume that a teacher is requesting assistance when referring a student for special education, it is also reasonable to assume that the teacher has exhausted his or her patience and/or arsenal of ideas to remediate the presenting concern, or for some other reason, wishes the child removed from the classroom. An alternative to the traditional model of seeking child pathology and attempting remediation through a special education program is to offer consultative assistance in developing and implementing prereferral interventions at the classroom level. Numerous researchers (e.g. Bahr et al., 1988; Carter & Sugai, 1989; Fuchs, 1991; Fuchs et al., 1990; Gresham 1989; Witt, 1986; Ysseldyke et al., 1983) have suggested the use of classroom-based prereferral interventions as a model to reduce the number of students with mild disabilities placed in special education pull-out programs.

### Prereferral Interventions - The Model

While the use of behavioral consultation in the schools dates back to the 1960s (e.g., McKenzie, Egner, Knight, Perelman, Schneider, & Garvin, 1970), the process of formalized consultative-based prereferral interventions has its roots in a behavioral consultation model first offered as a treatise by Bergan (1977). Through this model, assistance in the understanding and application of behaviorally based principles is offered to the classroom teacher in an attempt to alleviate concerns without removing the individual student from the mainstream classroom environment. Since it attempts to resolve instructional issues at the regular classroom level, the model is consonant with the least restrictive environment doctrine required by PL 94-142.

The model is based on ecological principles (Graden, Casey, & Christenson, 1985). Instead of attempting to identify and categorize individual pathology, student problems are conceptualized in the context of the classroom. Variables such as the teacher, the student, and related instructional elements are all considered in problem analysis. The model reflects a move towards consultative services. It is designed to benefit students in an indirect manner by changing the behavior of teachers to more appropriately accommodate differentiated behavioral and instructional needs within the classroom. In this model,

the resources traditionally used to diagnose and place students into special education pull-out programs are redirected towards providing assistance in the regular classroom (Fuchs, 1991).

According to Graden, Casey, and Christensen (1985), the goal of the prereferral intervention model is to "implement systematically intervention strategies in the regular classroom and to evaluate the effectiveness of these strategies before a student is formally referred for consideration for special education placement" (p. 378). While Graden, Casey, and Bonstrom (1985) were the first to formally apply the definition and articulate the goals of prereferral interventions in the special education literature (Graden, 1989), numerous authors (e.g., Fuchs, 1991; Fuchs & Fuchs, 1989; Fuchs et al., 1990; Pugach & Johnson, 1989) have offered similar definitions and goals. For example, Fuchs (1991) characterized prereferral interventions as an attempt to accommodate difficult-to-teach (DTT) students in the most normal setting possible, based on the principle of prevention and immediate assistance to the classroom teacher.

A related secondary goal of the model is to reduce the number of students placed into special education programs (Graden, 1989; Graden, Casey, & Christensen, 1985). Since the point of referral for special education appears to be the primary determinant of whether or not a student is

placed into special education (Ysseldyke et al., 1983; Ysseldyke & Thurlow, 1984), the prereferral intervention model is aimed at developing interventions at the point of initial referral. Otherwise stated, if interventions are the outcome of a request for assistance by the teacher, fewer students will be evaluated to determine whether or not they are eligible for special education, and correspondingly, fewer students will be pulled out of the regular classroom to receive special education services.

#### Prereferral Interventions--The Research Base

Given the many arguments for devising models to accommodate students with mild disabilities in the regular classroom, the scope of research on the use and effectiveness of prereferral interventions has been surprisingly deficient. Existing studies can generally be broken into several specific categories: (a) applied experimental analysis, (b) survey analysis of intervention use and effectiveness, and (c) attitudes towards prereferral interventions.

#### Applied Experimental Analysis

As early as 1976, researchers (Cantrell & Cantrell, 1976) began to investigate methods of meeting the needs of potential special education students in the regular classroom. Cantrell and Cantrell conducted a study entitled the Prevention-Intervention Project (PIP). The goal of PIP

was to create a support system designed to assist teachers in solving children's problems prior to referral for special education services. The researchers believed that maintaining children in the regular classroom would reduce the stigma associated with labeling and the possible exclusion of children with disabilities from opportunities available to other students.

As part of the project, Cantrell and Cantrell trained support teachers over a six-week period in the areas of behavioral principles, basic evaluation techniques, program assessment techniques, academic programming, contingency management, group processing, and coordinated ecological planning. The support teachers, in turn, worked with teachers in two experimental schools to assist in addressing the problems of any child or children for whom the referring teacher was concerned. In addition, the teacher consultants had access to the project trainers for assistance in case review and in formulating intervention suggestions which could be used by the classroom teacher.

Cantrell and Cantrell found that over four times as many first grade pupils and two times as many second grade pupils were referred for special education by control group schools than by those schools receiving assistance from the teacher consultants. Extrapolating from their findings, the researchers drew the implication that teachers view the availability of immediate support services as sufficient to

address the majority of student-based concerns. They also believed it is possible that teachers actively work to build a case against a child because that is the most acceptable way to access psychological services, which are typically more available to resource room teachers than to regular classroom teachers.

Chalfant et al. (1979) developed a Teacher Assistance Team model to provide a day-to-day peer problem-solving group for teachers in need of assistance in a particular building. Believing that many regular classroom teachers lack the training, confidence, and/or experience to manage or individualize for challenging students, Chalfant et al. desired to develop a process "to obtain more efficient and effective delivery of special help to children by placing the initiative for action in the hands of classroom teachers" (p. 85). They hypothesized that the increased attention to referrals at the building level would reduce the number of inappropriate referrals for special education and create more effective usage of special education personnel.

In order to test their proposition, the researchers implemented a trial site Teacher Assistance Team project in seven schools in a midwestern school district. Over a one-year period, schools using the Teacher Assistance Team model successfully resolved the problems for 129 out of 203 teacher referrals to the team. Seventy-four children were

referred beyond the team for more intensive special education assistance. Inasmuch as all teacher concerns previously would have been routed directly to special education, Chalfant et al. concluded that the potential referrals to special services were reduced by more than half.

Graden, Casey, and Christenson (1985) similarly proposed a prereferral intervention model with focus upon consultative support, objective data codification, and documentation of efforts and results. They argued that a request for formal evaluation should be preceded by a consultative process to identify and define the specific areas of concern, to explore possible interventions, and to implement and evaluate the interventions. Using Bergan's (1977) model of behavioral consultation, Graden et al. proposed a process of collaborative decision making between the referring teacher and consultant to engineer a plausible solution to a mutually agreed upon definition of the student problem. If initial intervention attempts proved unsuccessful, detailed observation of the student by an assigned professional support person (e.g., school psychologist) would follow. The student would be observed in relevant school settings in order to note the frequency and duration of behaviors and for normative comparisons with other students. Observational activities would result in a redefinition of the presenting problem and additional

attempts at intervention prior to referral for special education consideration. The fundamental stages of Graden et al.'s model thus require the identification, definition, and clarification of the problem, analysis of the components of the classroom ecology that affect the problem design, and implementation of interventions and the evaluation of the effectiveness of the attempted interventions.

Accepting the proposition that a major goal of classroom interventions is to reduce the inappropriate placement of students in special education, Graden, Casey, and Bonstrom (1985) sought to test the theoretical propositions of the prereferral intervention components earlier advanced by Graden, Casey, and Christenson (1985). Using a consultation-based prereferral intervention process, the researchers implemented their model in three schools (two elementary and one junior high), with special education resource teachers serving as primary consultants to the regular education faculty. All consultants were trained and supervised by the senior author (Janet Graden), who also served as a system-wide consultant for all of the schools in the project. In three additional schools (two elementary and one junior high), a single school psychologist (Graden) acted as the primary consultant to regular education teachers. All buildings also had additional on-site resource LD teachers who worked both directly with students and as consultants to the faculty at large.



Graden, Casey, and Bonstrom attempted to enlist participation from an additional elementary school, but the school declined to be a part of the project. According to the authors, the declining school strongly advocated a pull-out special education delivery system and did not wish to entertain any effort to change.

As part of the implementation stage, the special education resource teachers who served as the primary consultants to the regular education faculty received three days release time for training in methods of collaborative consultation, and observational and intervention skills. The training was conducted by Graden, who also met with the consulting teachers on a weekly basis to discuss cases and individual building issues. Ongoing support was elicited from the building principals through weekly to biweekly on-site visits by the senior author. In the other three schools, implementation was conducted primarily by Graden.

One of the primary purposes of the project was to evaluate the effectiveness of the prereferral intervention model on the impact of referral rates for special education. Graden et al. predicted that consultation use would increase, that referrals for special education consideration would decrease, that the number of students tested for special education consideration would decrease, and that the number of students placed in special education programs would decrease. Contrary to predictions, in those schools

in which a resource special education teacher acted as primary consultant, the number of students placed in special education programs remained relatively constant with baseline levels. While the number of students tested dropped during the implementation year, they returned to normal levels a year after implementation. Although referrals for consultation increased as predicted, with the exception of one school, this had a negligible impact on the number of students ultimately tested and placed in special education. In only one school, the junior high school, did the number of students placed in special education appreciably change. Students placed into special education dropped from 41% of those tested in the baseline year to 9% in the implementation year and 13% in the post-implementation year.

More notable and consistent changes were evident in those schools served by the school psychologist as the primary consultant. In these schools, there was a 66% decrease in the number of students tested between the baseline and the implementation year. In addition, the number of students placed into special education dropped from 44% of those tested to 15% from baseline to implementation.

Overall, there was considerable variability among schools. In two of the six schools, practices remained essentially unchanged. The use of prereferral intervention

had no effect in moderating system changes and no effect in reducing special education placements. In the remaining four schools, the most dramatic effects were noted in the buildings were served by the author of the project.

Since Graden et al. offered only a descriptive quantitative analysis, it is not possible to determine the statistical significance of their efforts. However, while their data are inconclusive, the variable successes of their efforts offer sufficient justification for further investigation. From a practical standpoint, however, given the degree of training and ongoing support demanded by their efforts, one might expect more notable decreases in the students placed into special education.

In a related effort, Ponti et al. (1988) examined a single case example to describe the systems level activities involved in successful implementation of a consultation-based prereferral intervention model. Using one of the elementary schools which previously rejected the opportunity to serve as an implementation building for a prereferral intervention model (Graden, Casey, & Bonstrom, 1985), Ponti et al. predicated their efforts on the hypothesis that one of the most difficult issues related to implementation of a prereferral intervention model is its integration into a school's organizational routine. Ponti et al. first sought to obtain administrative sanction through an elaborate needs assessment following an extended period of biweekly meetings

with the building principal. One of the authors of the project, Janet Graden was the assigned school psychologist which facilitated the ability of the researchers to interact on a regular basis with the principal and building teachers.

In order to secure administrative support, Ponti et al. stressed the benefits of increased collaborative interactions between the regular and special service staffs, as well as the potential for increased cost effectiveness from a prevention oriented system. They also noted that the proposed model was not intended to replace other informal consultation interactions which already occurred between various staff members.

Following administrative sanction, the authors undertook a building based participatory planning process in order to gain knowledge about the types of building changes which would be necessary for successful implementation of a new approach. Teachers had the opportunity to express any concerns about the proposed organizational changes and the potential consequences on current teaching and classroom management practices. After a process of detailed elaboration and explanation to the faculty, the prereferral intervention process was implemented on a school-wide basis.

While limited in generalizability due to the formative nature of the project, Ponti et al. reported that adoption of the prereferral intervention model reduced the number of psychoeducational assessments by over 40% from previous

years' baseline measures. The authors attributed the success of the project to the collaborative planning process which linked the organizational changes to the needs of the school. Despite their successes, they noted a number of barriers to effective implementation, including the special services staff's lack of training in consultation and teaming strategies and the difficulty in coordinating schedules for prereferral team meetings. Of paramount concern was the amount of teacher time needed to implement interventions.

In the most comprehensive effort to date, Fuchs and Fuchs (1989) attempted to develop, implement, and validate a prereferral intervention model entitled the Mainstream Assistance Team (MAT) Project. Presupposing a relationship between degree of efficiency and teacher acceptability of interventions, the authors undertook an experimental investigation of the effectiveness of three increasingly inclusive versions of a behavioral consultation model for implementation of prereferral interventions. In their approach, behavioral consultation is conducted within a series of four interrelated stages: (a) problem identification, (b) problem analysis, (c) plan implementation, and (d) problem evaluation. When developing interventions, the consultant essentially guides the teacher through the stages by a succession of structured interviews

in which specific objectives have to be accomplished before proceeding to subsequent stages.

The primary objective of the first stage, problem identification, is to define the problem behavior in observable terms and to obtain a reliable estimate of its frequency, intensity, and/or duration. The existence of the problem is validated in the problem analysis stage, at which time the teacher and consultant also identify instructional and student variables which may contribute to a solution and collaboratively design a remediation plan. During the third stage, plan implementation, the consultant monitors implementation and provides corrective feedback to the teacher. Lastly, the effectiveness of the intervention is evaluated during the problem evaluation, or final stage.

In order to explore the importance of the various components of the model, the researchers created and applied three increasingly inclusive variations of behavioral consultation. In the first condition (Behavioral Consultation 1 or BC 1), the consultant and teacher worked collaboratively to identify and analyze the problem and to create a plausible intervention. In condition two (BC 2), the consultant and teacher worked together in identifying and analyzing the problem, and in creating a plausible intervention. In addition, the consultant made a minimum of two classroom visits to provide corrective feedback to the teacher during the life of the intervention. In the most

inclusive condition (BC 3), the consultant and teacher collaboratively identified and analyzed the problem, and created a plausible intervention. In addition, the consultant provided ongoing corrective feedback and the teacher and consultant collaboratively evaluated the intervention effects.

The consultants for the project consisted of 10 school-based support staff, including 5 special education resource room teachers, 2 school psychologists, and 3 pupil personnel specialists. They were assigned to four experimental schools on the basis of existing service responsibilities. As a comparison group, five control schools were matched with the experimental schools on the basis of location, level (middle school), proportion of Black students, annual percentage of pupils referred for psychological evaluations, average reading and math scores, a composite index of a school staff's likelihood to refer students for evaluation, and percentage of students receiving free lunch.

All consultants received a total of 14 hours of training in the areas of problem solving, and the collaborative and data-based nature of behavioral consultation. Training included role playing with corrective feedback, the use of videotapes of actual classroom conflict, systematic observational interval recording procedures and a review of a broad range of behavioral

interventions. In order to maintain fidelity of treatment, the consultants were instructed to operate from a written script during all stages except for plan implementation.

Teachers in the experimental schools were not randomly selected. They were recruited on the presumed basis that they would work cooperatively with the consultant assigned to their respective school. In addition, to be selected, teachers had to have at least one difficult-to-teach pupil at risk for special education referral or grade retention and express a willingness to participate in the project. In the control schools, principals and project staff recruited an equal number of teachers with one or more difficult-to-teach pupils. All teachers and consultants received a small cash stipend for their participation.

Results indicated that, relative to the control group, there was a significant decrease in teachers' negative ratings of difficult-to-teach students in BC 2 and in BC 3. There were, however, no differences between teacher ratings in the control group and BC 1.

Interestingly, independent observations of student behavior by graduate students did not always corroborate the rating perceptions of the teachers. As expected, in the control group, students did not display a pre- to post-intervention decrease in target behavior. However, pre- to posttest decreases in target behaviors in the group which



included corrective feedback (BC 2) and in the group which included collaborative rating of the effectiveness of the intervention (BC 3) also failed to materialize. Fuchs and Fuchs believe this is important, because it is teachers' attitudes toward difficult-to-teach students that often means the difference between "willingness to modify a classroom to accommodate special learners and refusal to tolerate such students" (Fuchs & Fuchs, 1989, p. 275).

It was also evident to the researchers that many interventions were poorly conceptualized and/or executed. In the 23 of 24 cases in which teachers used some form of student reinforcement as part of the intervention plan, 61% failed to maintain written records of student behavior. Of the 24 interventions examined, in 6 cases the teachers failed to monitor the target behavior, and in another 8 cases student reinforcement was arbitrarily and unspecifically defined. Given that the teachers reported successes, but presented little objective data, and given the lack of corroboration by independent observers, the authors concluded that the effectiveness of an intervention must at least in part be gauged by the perception of success vis-a-vis the referring teacher.

In a related follow-up, Fuchs (1991) attempted to strengthen the earlier efforts of Fuchs and Fuchs (1989) by requiring use of contingency contracts and data-based monitoring procedures in the development of prereferral

interventions. In the new effort project teachers were still assigned to varying conditions of inclusive behavioral consultation: (a) Script 1 which required collaborative analysis of the problem behavior and development of prereferral interventions, but no corrective feedback; (b) Script 2 which added corrective feedback; or (c) Script 3 which required all components of the less inclusive versions, also required collaborative evaluation of the intervention success, but teachers were now required to use student behavioral contracts for a minimum of three weeks.

Development of the contracts followed a prescribed script and required six specific dimensions: (a) type and degree of desired student change, (b) specific activities to which the contract applies, (c) method of monitoring behavior or performance, (d) nature of reinforcement, (e) how reinforcement is delivered, and (f) whether the contract is renegotiable.

The data-based monitoring involved either: (a) time interval recording, which was defined as, "a monitoring technique used to record whether a social behavior occurs or does not occur during a predetermined period or interval" (Fuchs, 1991, p. 252); or (b) product inspection, which was defined as "the evaluation of academic work at the end of a predetermined duration" (p. 254). All teachers and consultants in the experimental groups were instructed in

specific guidelines for use and application of both time interval recording and product inspection.

As Fuchs was also interested in the effectiveness and efficiency of teacher monitoring in comparison with student self-monitoring, project teachers were assigned to either teacher monitoring or student self-monitoring groups. In the self-monitoring groups, students were responsible for evaluating their own social behavior through interval recording or academic performance through the process of product inspection.

Results indicated that positive changes among Script 2 and Script 3 pupils were statistically greater than pupil gains in Script 1 and in control group conditions. In addition, behavioral change was maintained over a two- to three-week follow-up period. Also notable was the fact that student change was significantly greater than previous research efforts (Fuchs & Fuchs, 1989) which did not require contracting or data-based monitoring techniques. Positive student change was consistent across teacher monitored and student monitored groups. Fuchs reported that "not only did project pupils reduce their problem behavior in an absolute sense, they also lessened it relative to the frequency of peers' display of identical behavior" (p. 262). Fuchs attributed the success of the project to the specificity of the contingency contracts and data-based monitoring procedures.

In an effort to further refine the Mainstream Assistance Team (MAT) process, Fuchs et al. (1990) examined whether the overall length of time a target behavior was monitored had an effect on teacher perception of success. They determined that a shortened version of the MAT process, which involved behavioral monitoring over an average 14- to 22-day period was equally as effective as the extended MAT process with an average of 18 to 28 days of behavioral monitoring. However, in a related finding which the authors were unable to explain, they found that control group students reduced targeted problem behaviors equally as effectively as either MAT monitoring group.

While Fuchs (1991) expressed an interest in the difference in effectiveness between teacher monitored and student monitored interventions, he did not explicitly compare them in his discussion of findings. This relationship was, however thoroughly examined in a study by Bahr et al. (1988). Bahr et al. measured the efficacy of applying student self-monitoring techniques (coupled with contingency contracts and data-based monitoring procedures) to that of teacher monitoring activities in the implementation of prereferral interventions. Teachers were instructed in the use of intervention materials and how to reliably use a classroom observation system by school-based support staff, consisting of five special education resource teachers, two pupil personnel specialists and a librarian.

All support staff consultants received limited release time from their normal responsibilities and received specific training in observational techniques. In addition, the researchers recruited four graduate students to assist in data collection. For research purposes, the consultants and teachers were not at liberty to deviate from packaged prereferral intervention techniques consisting of contingency contracts monitored through product inspection and interval recording procedures.

Bahr et al. found that pupils in the student monitoring group displayed a significantly greater decrease in target behavior than did pupils in a teacher monitoring group, both of which showed significantly greater decreases in target behavior than the control group. The researchers also noted no regression during follow-up observations in the student and teacher monitoring groups, indicating that the pupils maintained their reduction in target behaviors at three weeks beyond cessation of treatment. Bahr et al. concluded that student monitoring with contracts may be superior to teacher monitoring with contracts in producing desirable behavioral change. Given the effectiveness of student monitoring, they recommend it as a procedure to employ as part of the pre-intervention process, which they suggest will free teacher time to engage in other activities.

Based on the MAT studies (Bahr et al., 1988; Fuchs & Fuchs, 1989; Fuchs et al., 1990), Fuchs (1991) offered a number of important considerations for implementing a prereferral intervention model. These included: (a) the need to build consultative activities into the job descriptions of support staff; (b) the need for a consultant to coordinate the overall direction of the prereferral effort; (c) the need for consultants to receive adequate training in the process of consultation in order to fully understand all intervention(s) to be employed and how to implement them with minimal disruption to the teacher and class; (d) the need for efficiency in the consultation process; (e) the need to objectively define the problem behavior, to set explicit goals for students and/or teachers, to collect frequent data on performance before, during, and after implementation of the intervention, and to conduct systematic formative evaluation of intervention effectiveness; (f) the need to socially validate the data; (g) the need for classroom interventions to be feasible and acceptable to teachers; and (g) the need for fidelity of treatment.

### Survey Analysis

Given some of the preliminary research successes noted through development and implementation of prereferral intervention models, it would seem reasonable to believe

that teachers and school systems would readily adopt the practice at the state and local level. In fact, as of 1987, 34 state education agencies required or recommended prereferral interventions for students suspected of having a disability (Carter & Sugai, 1989). However, in the same survey Carter and Sugai determined that in more than three-quarters of the cases, respondents indicated that prereferral interventions were only sometimes effective in maintaining students in the regular education setting, or that respondents had no basis for making such a judgment. In only two cases was it indicated that prereferral interventions were usually effective in maintaining students in the regular education classroom. Also notable was the fact that regular education teachers received very little support in their efforts to remediate student concerns through the prereferral process. In most cases classroom teachers were solely responsible for developing and implementing prereferral interventions.

Carter and Sugai's analysis of the composition and quality of prereferral interventions is consistent with that of Ysseldyke et al. (1983). Ysseldyke et al. took an early interest in the use of prereferral interventions. Arguing that there had been no systematic attempt "to document specifically the kinds of interventions regular classroom teachers use prior to referring students for psychoeducational evaluation" (p. 184), Ysseldyke et al.

examined the interventions used by 105 elementary classroom teachers before referring students for a psychoeducational evaluation. They discovered that out of a total of 328 interventions, only 13.4% were the direct result of a conference with educational support personnel and that only 28.6% of the surveyed teachers even mentioned the use of a time period of intervention implementation, usually phrased in very general terms (e.g., weeks or months).

Ysseldyke et al. concluded that most interventions are implemented for a nonspecific period of time with no supporting data to substantiate or refute the relative effectiveness of the teachers' efforts. In fact, successes or failures were based primarily on perceptions of the respondents, with teachers reporting no data to validate their judgments. The researchers further noted a lack of consultative support service for assisting teachers, which they believed was a severe impediment to the effectiveness of the reported interventions. Again, conclusions regarding the effectiveness of the interventions were limited to teacher perceptions rather than to any objective data generated from the intervention process. Finally, few significant relationships were found between the reasons given for referral and the particular types of prereferral interventions attempted. For example, it was not uncommon for teachers to report behavioral interventions for



curricular issues such as small group placements or repetition of directions.

In applying the principles of behavioral consultation, Ysseldyke et al. suggested that the prereferral process could be improved by generating more objective data on students and by more precisely documenting the intervention process. They suggested that before students are referred for evaluation, teachers should be able to document the attempted interventions, the particular behaviors they tried to change, the level of change necessary for the student to remain in the regular classroom, the time period of implementation, the roles of related support personnel, and the amount of change produced by the intervention.

If the work of Carter and Sugai (1989) and Ysseldyke et al. (1983) is an accurate reflection of actual practice, apparently while many states recognize the possible benefits of prereferral intervention and still others mandate their use, a gap continues to exist between recommended best practice and existing trends within the field. While states can mandate procedural application, they cannot mandate quality.

The State of Iowa, for example has required the use of prereferral interventions for a number of years (Iowa, 1989). However, in a comprehensive effort to revamp special education services within the state, some disturbing facts have emerged. Consistent with the data generated by Carter

and Sugai (1989), in a survey of public school districts and 13 of the 15 state Area Education Agencies (AEAs), Reschly and Flugum (1992) determined that actual intervention assistance for classroom teachers occurred less than half the time for students referred for special education consideration. They further determined that Teacher Assistance Teams were available in less than 25% of Iowa school districts and support service expertise was not typically utilized unless a student specifically qualified for special education.

Further, while most regular education teachers indicated initiation of some sort of prereferral intervention attempts, Reschly and Flugum concluded that the quality of their efforts fell far short of reasonable standards. In only 22% to 28% of the reported cases did an objective behavioral definition guide the structure of the intervention. In even fewer cases did teachers use any form of direct measure of the behavior of concern. The results of the interventions were graphed less than 5% of the time and postintervention measures were compared with baseline data in fewer than 10% of the reported cases. In nearly 25% of the regular classroom teachers surveyed, and nearly half of the support staff surveyed, it was noted that more prereferral assistance would have rendered a comprehensive evaluation unnecessary.

In a follow-up paper, Flugum and Reschly (1992) argued that the promises of prereferral interventions have not been realized. They make the case that prereferral interventions have failed to reduce the number of students receiving special education assistance, offering the explanation that: (a) few prereferral interventions are presently being provided, and (b) the prereferral interventions that are being provided are of poor quality. Borrowing from Fuchs (1991), they suggested that, in order for prereferral interventions to be successful in remediating student problems at the classroom level, there must first be a behavioral definition of the problem; pre-intervention baseline data within the natural setting must be collected; the plan must be implemented with integrity, or as Fuchs stated, with treatment fidelity; the effects of the intervention should be measured through graphing or monitoring; and outcome performance must be compared to baseline data.

#### Attitudes Towards Prereferral Interventions

Witt (1986) questioned why so many teachers resisted the use of classroom prereferral interventions. He observed that it "is becoming increasingly apparent that a teacher's decision to use an intervention is based upon a wide array of factors" (p. 37), with effectiveness being only one of a number of considerations. He argued that, in addition to

effectiveness, it is also important to consider teacher time and availability of other personnel resources, the theoretical orientation of the intervention and its degree of intrusiveness on normal classroom operations. He further proposed that, when an intervention is recommended, the teacher's perception of its likely effectiveness is more apt to lead to implementation than any particular data supporting the intervention.

Even given the allure and mandate for prereferral interventions, Witt argued that it is easy to understand why teachers prefer a testing and placement sequence over a consultant prereferral intervention model. He noted that interventions generally require changes in existing regularities and teacher behavior. Placement in special education, on the other hand, has a relatively negligible effect on normal classroom operations, because teacher behavior remains relatively constant. It is therefore easier to seek out child pathology than it is to engineer global system changes.

Gresham (1989) believes that part of the reason why prereferral interventions have not reduced special education placements is that treatments by and large are not implemented as planned (i.e., there is little treatment integrity). He noted that, "Many failures in consultation and interventions probably can be attributed to the fact that intervention plans are not implemented as intended"

p. 37). Gresham identified several factors which he believes are directly related to treatment integrity:

(a) complexity of treatment, (b) time requirements, (c) required materials and/or resources, (d) number of treatment agents required, (e) perceived and actual effectiveness of treatments, and (f) motivation of the treatment agents.

Gresham believes that, as the complexity of a treatment increases, the integrity of the treatment decreases. Given the obvious relationship between complexity of treatment and involvement of time, Gresham noted that one of the most frequent reasons given by teachers for not implementing a consultation intervention plan is lack of time. Not surprisingly, those interventions which require additional materials or resources and/or more than one change agent also tend to suffer a corresponding loss of treatment integrity. On the other hand, Gresham noted that treatments which are perceived by teachers to be effective may be implemented with more integrity, thus enhancing the likelihood of intervention success. Lastly, Gresham argued, low motivation is a notable impediment to treatment integrity. If the teacher's goal is to remove rather than to remediate, even requiring prereferral intervention does not assure integrity of treatment.

### Summary

The application of prereferral interventions offers some promise for modifying the existing educational system to allow for the accommodation of mildly disabled students in the regular classroom environment. However, research on the use and effectiveness of prereferral interventions, is sparse and inconclusive. Most of the applied research can be categorized into four models: Teacher Assistance Teams (Chalfant et al., 1979); Prevention-Intervention-Project (Cantrell & Cantrell, 1976); Prereferral Intervention Model (Graden, Casey, & Bonstrom, 1985; Ponti et al., 1988); and the Mainstream Assistance Team Model (Bahr et al., 1988; Fuchs, 1991; Fuchs & Fuchs, 1989; Fuchs et al., 1990).

All of the models have strikingly similar characteristics. They are designed to remediate problems without resorting to pull-out special education programs. They are preventative in nature and depend on the use of consultative-based services to assist mainstream teachers in devising, implementing, and measuring the effectiveness of classroom-based interventions.

While the research does not offer conclusive evidence that any of the models are consistently successful in achieving desired student outcomes, the Mainstream Assistance Team (MAT) model offers the greatest promise of fully realizing the potential of prereferral interventions. The MAT project demonstrated that consultative-based

interventions, coupled with the use of student contingency contracts and data-based monitoring procedures could be successful in intervening with difficult-to-teach pupils directly in the classroom.

The authors of the MAT project believe that the success of prereferral interventions depends in part on highly structured activities by the consultant and classroom teacher. They found, for example, that when consultants followed specific scripts and teachers utilized highly structured behavioral contracts, interventions were significantly more successful than when the consultants and teachers were at liberty to devise novel treatments.

To this end, they authored a guide entitled, Mainstream Assistance Teams: A Handbook on Prereferral Intervention (Fuchs et al., 1989), which is designed to assist consultants in collaborating with teachers in the design and implementation of classroom-based interventions. The handbook captures the essence of the behavioral consultation principles used in the research efforts on the MAT. When properly used, application of the principles within the handbook may serve to improve the quality of prereferral interventions and correspondingly demonstrate that many student problems are treatable in the mainstream classroom setting.

## Chapter 3

### METHOD

In an attempt to demonstrate whether students who manifest learning and/or behavioral problems could be successfully treated in a mainstream classroom environment, the following research questions and related hypotheses were posed.

#### Research Questions

1. Does the level of inappropriate behavior of students being considered for special education evaluation (target students) differ from the level of inappropriate behavior of other students in the classroom?
2. Will the level of inappropriate behavior of target students decrease from baseline measures as a function of prereferral interventions?

#### Hypotheses

1. The level of inappropriate behavior of students being considered for special education evaluation (target students) will be greater than the level of inappropriate behavior of other students in the same classroom at pre-intervention.

Stated in the null, the level of inappropriate behavior of students being considered for special



education evaluation (target students) will be the same as the level of inappropriate behavior of other students in the same classroom at pre-intervention.

2. The level of inappropriate behavior of target students will be the same as the level of inappropriate behavior of other students at post-intervention.

Stated in the null, the level of inappropriate behavior of target students will be different than the level of inappropriate behavior of other students at post-intervention.

3. The level of inappropriate behavior of target students will decrease as a function of prereferral interventions.

Stated in the null, the level of inappropriate behavior of target students will not change as a function of prereferral interventions.

#### Independent Variable

The independent variable was a structured behavioral consultation process based on The Mainstream Assistance Team: A Handbook on Prereferral Intervention (Fuchs et al., 1989). The purpose of the procedures detailed in this handbook (otherwise referenced as the MAT), is to assist consultants in collaborating with teachers in the design and

implementation of classroom-based interventions for difficult-to-teach pupils. The MAT handbook systematically guides the consultant through the process of: (a) problem identification, (b) gathering baseline data on target students, (c) gathering baseline data on gender matched peers, (d) problem validation, (e) goal specification, (f) developing student/teacher contracts, (g) identifying reinforcers, (h) monitoring target behavior, (i) treatment monitoring and fidelity, (j) post observations, and (k) treatment evaluation.

The MAT process is designed to assist the consultant in intervening in cases in which students demonstrate problem social behaviors (interval monitoring) and/or in cases in which students demonstrate poor work orientation (product monitoring). Fuchs et al. (1989) defined problem social behaviors as behaviors which (a) interfere with the teacher's ability to conduct class normally and/or, (b) interfere with other students' ability to work. They defined poor work orientation as poor work habits which interfere with the performance of otherwise capable students (e.g., failure to start or complete work, distractibility, doodling).

### Interventions

Selected school psychologists (who served as teacher consultants) implemented the MAT process in target schools

during the period of January 1, 1994, through May 31, 1994. Unless otherwise specified as part of project methodology, the MAT was implemented precisely as directed in The Mainstream Assistance Team: A Handbook on Prereferral Intervention (Fuchs et al., 1989).

#### MAT Modifications

The MAT handbook prescribes intervention assistance only for the most difficult-to-teach (DTT) students. Without modification to allow for broader-based application, some student problems which could have otherwise resulted in a referral for special education may not have come to the attention of the consultant. In order to effectively validate the success of the MAT in treating learning and/or behaviorally based problems, it was important to ensure that no teacher concern which would have otherwise warranted consideration for special education, was excluded from treatment consideration.

The flow of student referrals was altered, so that if a teacher had sufficient concern to request an evaluation for special education, his/her first formal request for assistance had to be directed to the school psychologist (the school psychologist assigned to each target building served as consultants for this project). This ensured that the teachers of all students who might otherwise be referred for special education had the opportunity to receive

assistance through the MAT process. While teachers were encouraged to immediately seek assistance from the school psychologist, nothing in the project precluded them from seeking other assistance before referring to the school psychologist.

The instructions of the MAT were modified so that they were personalized and did not focus exclusively on DTT students. For example, instead of saying to the referring teacher, "the goal of this project is for us to work together to make your most difficult-to-teach student easier to teach" (Fuchs et al., 1989, p. 4), the school psychologist said, "the goal of this project is for us to work together to make (student's name) easier to teach."

The MAT has a built-in process to resolve differences in teacher and observer perceptions of the frequency of target behaviors. Specifically, if the difference exceeds 20%, the consultant is instructed to try to obtain a compromise with the classroom teacher. If the difference is less than 20%, the consultant is instructed to accept the teacher's estimate. For the purpose of study, actual observational data were used for determining the effectiveness of the intervention.

The MAT provides the teacher an option to drop the target student from treatment if pre-intervention observations suggest the identified behavior is not as serious as originally thought. Dropping the student from

consideration was not an option in this project. School psychologists were instructed to follow-through by working with the teacher to redefine the problem behavior.

In order to minimize expectancy effects, it was necessary to use independent observers who were uninformed as to the identity of the target student. This required modifying the MAT method for gathering pre- and post-intervention observation data. The MAT prescribes two 20 minute observations at pre-intervention and two 20 minute observations at post-intervention. The consultant alternates between observing the target student and one of two randomly selected gender-matched peers. This results in twice as many data points for the target student than either of the randomly selected peers. It was necessary to lengthen the observational times by 10 minutes to allow for collection of an equal number of data points for the target student and each of the randomly selected peers. Students were referenced as: (a) Student A, (b) Student B, and (c) Student C. The school psychologist coded the identity of each student for later identification of the target student.

References in the MAT manual to contact or notify Peabody consultants were not germane to this project. School psychologists were instructed to ignore all references to contact or notify Peabody consultants.

### Integrity

The Mainstream Assistance Team: A Handbook on Prereferral Intervention (Fuchs et al., 1989) has a built-in operational check to enhance treatment fidelity. As part of the MAT process, the school psychologist visited the classroom on at least two occasions for each student intervention. The purposes of the classroom visitations were twofold: (a) to ensure the intervention was implemented as designed; and (b) if needed, to assist the teacher and/or student in properly implementing the intervention.

The first classroom visit was scheduled during one of the two days that the teacher initiated the intervention (phase I of the intervention), with the second visit scheduled to coincide with the point at which the student assumed an active monitoring role (phase II of the intervention). The MAT provides a checklist for documentation of classroom visitations. The checklist is designed to specifically monitor the operational components of the intervention and became part of the record of the intervention.

### Consultant Training

School psychologists were acquainted with all phases of the MAT and in the other specific data collecting methods required of this project. All instruction was provided by

the project investigator and occurred in a session which lasted for 3 hours and 45 minutes. The goal of the training was to develop operational competency of the trainees' abilities to utilize the MAT as intended. Broader-based mastery of more global behavioral consultation skills was not the intended purpose of the training.

Specific objectives focused on MAT methods for:

(a) problem identification, (b) gathering baseline data on target students, (c) gathering baseline data on gender matched peers, (d) problem validation, (e) goal specification, (f) developing student/teacher contracts, (g) identifying reinforcers, (h) monitoring target behavior, (i) treatment monitoring and fidelity, (j) post observations, and (k) treatment evaluation.

Other objectives of the training focused on collecting the additional data required of the project. In order to obtain a measure of effect size, which was necessary to compute a noncentral F test (note design section), the school psychologist needed to determine the minimum degree of behavioral change necessary in order to say the intervention had an effect. After agreeing on the quantifiable goal for each student intervention, the school psychologist was instructed to ask of the teacher, "How much change will need to occur before it is noticeable?" Participating school psychologists were instructed to quantify the teachers' responses as a percentage of

inappropriate behavior. For example, if a teacher said that "if we can just reduce off task behavior by 15%, I would feel like we were making progress," the school psychologist would report 15% as degree of change necessary to validate an impact as a result of the intervention.

While the intent of the project was to provide MAT-based interventions for learning and/or behaviorally based concerns, not all requests for assistance specifically lent themselves to the MAT process. To this end, school psychologists and referring teachers had some degree of flexibility in bypassing the MAT process if it was apparent that extended consultation would interfere with obtaining appropriate levels of support for a particular student. School psychologists were therefore instructed to collaborate with the referring teacher on the development and implementation of MAT behaviorally based interventions on all referred students, unless it was mutually agreed that: (a) the presenting problem was not primarily learning or behaviorally oriented (e.g., voice articulation); (b) the problem warranted more significant intervention (e.g., significant mental impairment); or (c) the student's parents declined participation.

School psychologists were also instructed on data privacy and the need to keep data on all students referred for assistance, including those students who did not receive assistance through an MAT driven intervention. Records were



maintained on all referred students. For those students not receiving assistance through the MAT process, records documented the specific reason why the MAT was not applicable for the presenting problem.

Training outcomes were measured by the ability of each participating school psychologist to successfully:

(a) describe all the phases of the MAT process, (b) state the process for determining effect size on an individual case basis, (c) describe the method for maintaining data on referred students not treated through the MAT process, and (d) state the policy of nondisclosure or release of personally identifying information.

#### Independent Observer Training

An additional eight school psychologists who were not part of the treatment process were instructed in: (a) the observational data gathering technique prescribed by the MAT, and (b) variants of the MAT observational techniques which were used as part of this project. These individuals were uninformed as to the purpose of the project and served as nonbiased observers during pre- and post-intervention data collecting.

#### Reliability

In order to ensure inter-observer agreement on pre- and post-intervention measures of behavior, two school psychologists trained in observational techniques of the MAT

and the accompanying project variants, but otherwise uninformed to the intent of the project, blindly observed the first student referred in each target building (pre- and post-intervention observations #1). The same individuals concurrently observed two randomly selected gender matched peers in the same classroom. Thereafter, they blindly observed every fifth case (pre- and post-intervention observations #1) for each target building.

One of the two independent raters jointly observed with the project school psychologist during pre- and post-intervention observations #2. During these observations the independent rater blindly observed, but the project school psychologist was knowledgeable as to the identity of the target student. This process was repeated for every fifth referral in all target buildings. By design, any case that resulted in inter-observer agreement less than 80% required the co-observers to schedule additional observations until they met or exceeded the 80% criteria.

Raters alternated observations between each student every 10 seconds (8 seconds to observe and 2 seconds to record behavior). They were provided with an auditory tape which instructed them: (a) when to start observing, (b) when to stop observing, (c) when to start recording behavior, (d) when to stop recording behavior, and (e) when to switch the process between students. The auditory tape was used by all raters during all observational periods.

In order to combat observer fatigue, the order of observation was varied as follows: (a) pre-intervention observation #1 - Student A, Student B, Student C; (b) pre-intervention observation #2 - Student C, Student B, Student A; (c) post-intervention observation #1 - Student B, Student A, Student C; and (d) post-intervention observation #2 - Student A, Student B, Student C.

Of the 14 cases in which target students received intervention assistance, the prescribed method required dual raters for four different students. The raters failed to achieve 80% inter-observer agreement on only one occasion. This was due to a lack of precise synchronization of the observational cueing tape with the first referred student. Following correction of the synchronization, acceptable inter-observer agreement was obtained during another scheduled observation. Overall, inter-observer agreement ranged from a low of 81.36% to a high of 100%.

#### Dependent Measures

Pre- and post-intervention observational data of inappropriate behavior for target and paired students served as the primary dependent variable. As per MAT protocol, observational data was expressed as a ratio of inappropriate to total behavior. The MAT provides a very detailed process for defining, observing, and quantifying behaviors. Target students were observed on two occasions at pre-intervention

and on two occasions at post-intervention. In addition, two gender matched peers were randomly selected and observed as controls.

The investigator maintained the basic observational process but modified it by: (a) extending class observational times from 20 to 30 minutes; (b) collecting an equal number of data points for the target student and both of the two randomly selected gender matched peers; (c) using blind observations by independent observers on the first case in each target building, and every fifth case thereafter; and (d) observing the same control students at pre and post-intervention. At the end of the pre-intervention periods, a percentage of inappropriate behavior was computed for the target and paired students. This percentage was compared to post-intervention data to determine whether target students decreased inappropriate behavior as a result of the MAT.

For each referred student, the school psychologist randomly selected two gender matched peers from the same classroom. This was done by: (a) numbering a series of 3 x 5 index cards from 1 to 25, (b) examining a class list and totaling the number of same sex students in the classroom, (c) shuffling and placing into a container the same number of cards as there were same sex students in the classroom, (d) drawing two cards from the container, and (e) matching the cards to the class list to identify the students to be

selected (e.g., if a card with the number 5 was drawn from the container, the fifth gender matched student appearing on the class list was selected). Students were to be disqualified from serving as peer controls if: (a) they had also been referred for assistance through the MAT, (b) they had previously served as a peer control if more than one child in the classroom had been referred for assistance, or (c) their parents declined permission for participation. The selection process was to be repeated in the event of attrition or disqualification. However, this was not necessary as no students were disqualified, or lost to attrition.

The same students were observed at pre- and post-intervention. If a student who served as a control at pre-intervention was referred for assistance before the post-intervention observation, he/she would have been disqualified and a different gender matched peer would have been selected for observation. This procedure was not necessary as no student serving as a control at pre-intervention was later referred for assistance.

#### Design

Originally, a 2 x 2 repeated measures factorial design was proposed. The first factor was to have contained two levels: (a) target students placed on behavioral intervention plans as a result of the interaction between

the classroom teacher and the school psychologist, and (b) paired students matched by gender. While no specific hypothesis regarding interaction effects was made, the  $2 \times 2$  design would have permitted the measurement of any significant treatment interactions.

However, because of the small sample size (14 students), insufficient power was available to detect statistically significant differences between groups using the proposed  $2 \times 2$  factorial design. In order to minimize the risk of a Type II error, the statistical analysis was modified by conducting a one-way ANOVA for hypothesis 1 and hypothesis 2, and a repeated measures one-way ANOVA for hypothesis 3. While the ability to assess interaction effects was sacrificed, the ability to garner sufficient statistical power to identify statistically significant differences between groups was gained.

In assessing the effectiveness of intervention plans on target students, the paired students served as a control group and received no specialized assistance through behavioral intervention plans. As per MAT protocol, there were two paired students for each target student. Observational data of inappropriate behavior for target and paired students served as the primary dependent variable, which was expressed as a ratio of inappropriate to total behavior.

Because the dependent variable was expressed as a ratio of inappropriate to total behavior, a test of hypothesis two would require verification that target students would become more like their control peers as a result of treatment (i.e., inappropriate behaviors would be reduced as a function of the MAT). Thus, the logic of this design differed from typical research projects. Generally, when the null hypothesis is rejected, the researcher establishes that there is a statistically significant difference between treatment and control groups. In the design of this study, rejection of the null (hypothesis two) would verify that there was no statistically significant difference between treatment and control groups.

Since the attempt was to disprove differences rather than to disprove similarities, a noncentral F test (Londeree, Speckman, & Clapp, 1990) designed to accommodate the mathematical logic of hypothesis two was conducted. This required an a priori determination of effect size which was quantified by soliciting information from teachers regarding their perception of the minimal degree of change necessary in order to say that the student change would be noticeable.

## Procedures

### Selection of Target Schools

Three midwestern elementary schools were selected on the basis of: (a) support of the building principal, (b) the experience level of the assigned school psychologist (minimum of 3 years and maximum of 5 years field experience), and (c) the school psychologist's consent to participate. Because of the demographics of the sampling area, all schools were rural, with student populations falling within a range of approximately 300 to 600 Average Daily Membership (ADM).

### Selection of Teacher Participants

All teachers in selected buildings had an equal opportunity to participate. Teachers needed only to initiate a formal request for assistance to the school psychologist if they believed a student concern would otherwise be sufficient to warrant evaluation for special education. While teachers were encouraged to immediately seek assistance from the school psychologist, nothing in the project precluded them from seeking other assistance before referring to the school psychologist.

Regardless of the time the referring teacher first approached the school psychologist, no student was evaluated for special education until the referring teacher first



consulted with the school psychologist to determine whether a behaviorally based MAT intervention was warranted. While exceptions were to be allowed if the student's parents declined permission, all parents elected to allow their respective children to participate.

### Selection of Students

Target students were selected on the basis of teacher requests for assistance. The school psychologist and referring teacher collaborated in the development and implementation of MAT behaviorally based interventions on all referred students, unless it was mutually agreed that: (a) the presenting problem was not primarily learning or behaviorally oriented (e.g., voice articulation); (b) the problem warranted more significant intervention (e.g., significant mental impairment); or (c) the student's parents declined participation.

In addition to maintaining data on students receiving assistance through the MAT process, school psychologists also kept a count of those students referred for assistance, but not aided by the MAT. For those students not receiving assistance through the MAT process, records contained the specific reason why the MAT was determined not applicable for the presenting problem. This information was used in gauging how well the MAT process generalizes to a variety of presenting problems.

Paired students from the same classroom as each target student were matched on gender, but were otherwise randomly selected by the school psychologist. The school psychologist and/or other independent blind raters observed two paired students for each target student. Paired students remained constant through pre-intervention and post-intervention.

### Notifications

Before proceeding, written permission to implement the project was obtained from the building principal of each target school (Appendix A), and written notification of the intent of the project was distributed it to all building teachers (Appendix B). Informed parental consent was obtained for every student participating in the project (Appendix C & Appendix D). Lastly, the project was approved by the Human Subjects Research Review Committee of Drake University.

## Chapter 4

### ANALYSIS OF THE DATA

#### Research Questions

In order to assess the effectiveness of pre-referral interventions on the reduction of inappropriate behavior, a series of statistical tests were employed to address the following research questions and related hypotheses:

1. Does the level of inappropriate behavior of students being considered for special education evaluation (target students) differ from the level of inappropriate behavior of other students in the classroom?
2. Will the level of inappropriate behavior of target students decrease from baseline measures as a function of prereferral interventions?

#### Hypotheses

1. The level of inappropriate behavior of students being considered for special education evaluation (target students) will be greater than the level of inappropriate behavior of other students in the same classroom at pre-intervention.

Stated in the null, the level of inappropriate behavior of students being considered for special education evaluation (target students) will be the

same as the level of inappropriate behavior of other students in the same classroom at pre-intervention.

2. The level of inappropriate behavior of target students will be the same as the level of inappropriate behavior of other students at post-intervention.

Stated in the null, the level of inappropriate behavior of target students will be different than the level of inappropriate behavior of other students at post-intervention.

3. The level of inappropriate behavior of target students will decrease as a function of prereferral interventions.

Stated in the null, the level of inappropriate behavior of target students will not change as a function of prereferral interventions.

#### Statistical Tests - Hypothesis 1

A one-way factorial analysis of variance was used to determine whether the level of inappropriate behavior of students being considered for special education evaluation (target students) was greater than the level of inappropriate behavior of other students in the same classroom at pre-intervention. In utilizing the ANOVA as a statistical test, three assumptions were made: (a) normal

distribution of the population, (b) homogeneity of variance, and (c) independence of groups.

#### Normal Distribution of the Population

This assumption presumes that the scores in each group are normally distributed. Tests of skewness and kurtosis were computed for both groups, resulting in a positively skewed (.457), platykurtic (-1.035) distribution for target students and a positively skewed (1.126), leptokurtic (.505) distribution for comparison students. Although ANOVA is robust to violations of normality (Glass & Hopkins, 1981), caution in interpretation is warranted. An increased chance of Type II errors could exist due to relatively small sample sizes.

#### Homogeneity of Variance

Homogeneity of variance presumes that all groups have the same standard deviation. Based on an  $F_{Max}$  value of 2.04 and an  $F_{Max}$  critical value of 3.28, it was not possible to reject the null hypothesis that the variances were different, i.e., there were no statistically significant differences in the variances of the target and comparison groups.

#### Independence of Groups

This assumption presumes that each group is independent of one another. Since no treatment manipulation

had occurred at time of pre-intervention observations, it is reasonable to assume that violations due to the research design were unlikely. However, it is also reasonable to assume that in a normal classroom environment, the target and comparison students would interact with one another in the normal course of events. It is possible that enactment of inappropriate behavior by either the target or comparison students had an effect on one other. Caution in interpretation is warranted, as any increase in non-independence between groups increases the likelihood of a Type I error.

#### Analysis of Variance - Hypothesis 1

The combined mean scores of two pre-intervention observations for each target student were compared with the combined mean scores of two pre-intervention observations for each comparison student. As illustrated in Table 1, the analysis of variance supported the hypothesis. There was a statistically significant difference between the group of target students ( $\bar{M} = 29.711$ ,  $SD = 20.902$ ) and the group of comparison students ( $\bar{M} = 13.3$ ,  $SD = 13.9$ ) at pre-intervention,  $F(1, 40) = 9.025$ ,  $p = .0046$ . The null was rejected. The observed differences between groups was an unlikely chance event.

Table 1

ANOVA Table (Target and Comparison Groups at Pre-intervention)

Source	DF	SS	MS	F
Between	1	.258	.258	9.025
Within	40	1.144	.029	p = .0046
Total	41	1.402		

Statistical Tests - Hypothesis 2

A one-way factorial analysis of variance was used to determine whether the level of inappropriate behavior of students being considered for special education evaluation (target students) was the same as the level of inappropriate behavior of other students in the same classroom at post-intervention. In utilizing the ANOVA as a statistical test, three assumptions were made: (a) normal distribution of the population, (b) homogeneity of variance, and (c) independence of groups.

Normal Distribution of the Population

This assumption presumes that the scores in each group are normally distributed. Tests of skewness and kurtosis were computed for both groups, resulting in a positively skewed (1.548), leptokurtic (1.481) distribution for target

students and a positively skewed (.609), platykurtic (-.879) distribution for comparison students. Although ANOVA is robust to violations of normality (Glass & Hopkins, 1984), caution in interpretation is warranted. An increased chance of Type II errors could exist due to relatively small sample sizes.

#### Homogeneity of Variance

Homogeneity of variance presumes that all groups have the same standard deviation. Based on an  $F_{\text{Max}}$  value of 1.44 and an  $F_{\text{Max}}$  critical value of 3.28, it was not possible to reject the null hypothesis that the variances were different, i.e., there were no statistically significant differences in the variances of the target and comparison groups.

#### Independence of Groups

This assumption presumes that each group is independent of one another. While a specific test was not applied to isolate assumption violations, it is possible that the treatment and comparison groups were not entirely independent of one another. Treatment interventions were individually designed for each target student, but were not administered in isolation from the classroom as a whole. Since intervention activities were administered in the classroom, it is possible that treatment interactions occurred. Likewise, no attempt was made to isolate



reductions in inappropriate behavior of target students from the class as a whole. Caution in interpretation is warranted, as any increase in non-independence between groups increases the likelihood of a Type I error.

### Analysis of Variance - Hypothesis 2

The combined mean scores of two post-intervention observations for each target student were compared with the combined mean scores of two post-intervention observations for each comparison student. As illustrated in Table 2, the analysis of variance supported the hypothesis. No statistically significant differences existed between the group of target students ( $\bar{M} = 11.1$ ,  $SD = 13.6$ ) and the group of comparison students ( $\bar{M} = 11.5$ ,  $SD = 10.3$ ) at post-intervention,  $F(1, 40) = .121$ ,  $p = .7302$ .

Table 2

ANOVA Table (Target and Comparison Groups at Post-intervention)

Source	DF	SS	MS	F
Between	1	.002	.002	.121
Within	40	.606	.015	$p = .7302$
Total	41	.608		

Because the dependent variable was expressed as a ratio of inappropriate to total behavior, the likelihood that target students would become more like their control peers as a result of treatment (i.e., inappropriate behaviors would be reduced as a function of interventions) needed verification. Thus the logic of this design differed from typical research projects.

Since hypothesis 2 was designed to disprove differences rather than to disprove similarities, the null was rejected, indicating that there was no statistically significant difference between the target and comparison groups. While rejection of the null statistically validated that the probability of differences between the groups was small, it did not, in and of itself validate that the target and comparison groups were the same, which was one of the intents of the research design.

In order to determine whether the target and control groups were the same at post-intervention, a noncentral F test (Londeree et al., 1990) was computed. The noncentral F test required an a priori determination of effect size, which was expressed as a minimum degree of observable behavioral change. Responses were quantified as percentages with a mean of 18.606 and a standard deviation of 12.462. The noncentral F test indicated no significant differences between target and comparison groups  $F(1, 40) = .121$ ,  $p = .204$ .

Therefore, while the likelihood of two groups being statistically different is small, it is not possible to say they are statistically identical as was originally hypothesized. Otherwise stated, the fact that the target and comparison groups were the same at post-intervention could not be validated, nor could the fact that the target and comparison groups were different at post-intervention be validated.

### Statistical Tests - Hypothesis 3

A one-way repeated measures factorial analysis of variance was used to determine whether the level of behavior of target students decreased as a function of treatment interventions. In utilizing the ANOVA as a statistical test, four assumptions were made: (a) normal distribution of the population, (b) homogeneity of variance, (c) independence of groups, and (d) compound symmetry.

#### Normal Distribution of the Population

This assumption presumes that the scores in each group are normally distributed. Tests of skewness and kurtosis were computed for pre-intervention and post-intervention observations of target students. This resulted in a positively skewed (.457), platykurtic (-1.035) distribution at pre-intervention and a positively skewed (1.379), leptokurtic (1.583) distribution at post-intervention.

Although ANOVA is robust to violations of normality (Glass & Hopkins, 1984), caution in interpretation is warranted. An increased chance of Type II errors could exist due to relatively small sample sizes (Glass & Hopkins, 1984).

#### Homogeneity of Variance

Homogeneity of variance presumes that all groups have the same standard deviation. Based on an  $F_{\text{Max}}$  value of 8.48 and an  $F_{\text{Max}}$  critical value of 3.28, the assumption of homogeneity was violated in this comparison. A significant difference existed in the variances of the target group at pre-intervention and post-intervention. However, because of the equal numbers of subjects within each sample group, and the robustness of ANOVA, the heterogeneity of variances is not likely to have a notable effect on tests of significance (Glass & Hopkins, 1984).

#### Independence of Groups

This assumption presumes that each group is independent of one another. Since the analysis of variance was built upon repeated measures of the same students, and since none of the target students were from the same classroom, it can be assumed that no treatment interactions existed between groups.

### Compound Symmetry

The assumption of compound symmetry presumes that the relative rankings of each score in the repeated measures design will remain constant across observations, e.g., if a high percentage of inappropriate behavior was recorded in the first observation of a student in the treatment group, the same standing (relative to the treatment group as a whole) should be noted for that student at post-intervention. Otherwise stated, even though the student's inappropriate behavior may decrease as a result of treatment, his/her relation to the treatment group should not change. Violations of this assumption can result in an increase in the probability of a Type-I error (Glass & Hopkins, 1981).

While violations were not specifically tested for, Glass and Hopkins have noted that probability statements are rarely seriously underestimated. Concerns are only evident when the  $F$  test very closely approximates alpha. Consequently, the likelihood of a Type-I error would only increase if the resulting  $F$  score was very close to .05, and even then, only very negligible effects on the probability of a Type-I error would be likely (Glass & Hopkins, 1984).

### Analysis of Variance - Hypothesis 3

The mean scores of two pre-intervention observations for target students were compared with the mean scores of two post-intervention observations for the same group.

As illustrated in Table 3, the analysis of variance confirmed the hypothesis. There was a statistically significant difference between pre-intervention observations for target students (Observation #1 -  $\bar{M}$  = 29.711,  $\underline{SD}$  = 20.3; Observation #2 -  $\bar{M}$  = 30.0,  $\underline{SD}$  = 23.3) and post-intervention observations for target students (Observation #1 -  $\bar{M}$  = 10.3,  $\underline{SD}$  = 14.1; Observation 2 -  $\bar{M}$  = 13.5;  $\underline{SD}$  = 14.3),  $F(13,42) = 15.635$ ,  $p = .0001$ . Thus, the null hypothesis was rejected, indicating that the observed differences between pre- and post-intervention observations for target students were an unlikely chance event.

Table 3

#### ANOVA Table (Target Students at Pre- and Post-intervention)

Source	DF	SS	MS	F	P Value
Between	13	1.387	.107	5.365	.0001
Within	42	.836	.02		
treatments	3	.456	.152	15.635	.0001
residual	39	.379	.01		
Total	55	2.223			

As noted in Table 4, a subsequent test of multiple comparison (Tukeys) provided further evidence that the observed differences occurred as a result of treatment interventions. No significant differences were present between pre-intervention observations. Likewise, no significant differences were present between post-intervention observations. All comparisons between pre-intervention and post-intervention observations were, however, statistically significant.

Table 4

Tests of Multiple Comparison for Target Pre and Post Intervention Analysis

Comparison Groups	Mean Diff.	Tukeys
Pre-Obs. 1 vs. Post-Obs. 1	19.3	5.132*
Pre-Obs. 1 vs. Post-Obs. 2	16.2	4.286*
Pre-Obs. 2 vs. Post-Obs. 1	19.6	5.212*
Pre-Obs. 2 vs. Post-Obs. 2	16.5	4.365*
Pre-Obs. 1 vs. Pre-Obs. 2	-.3	.079
Post-Obs. 1 vs. Post-Obs. 2	-3.2	.846

\* Significant at 95% level of confidence.

Critical value of Tukeys = 3.79.

While a relationship between comparison students at pre- and post-observation was not specifically hypothesized,

a one-way analysis of variance (Table 5) detected no significant differences between pre-intervention (Observation #1 -  $\bar{M}$  = 14.0,  $\underline{SD}$  = 15.4; Observation #2 -  $\bar{M}$  = 12.1,  $\underline{SD}$  = 14.3) and post-intervention indices of inappropriate behavior (Observation #1 -  $\bar{M}$  = 11.2,  $\underline{SD}$  = 11.4; Observation 2 -  $\bar{M}$  = 11.9;  $\underline{SD}$  = 11.3),  $F(27,84) = 1.579$ ,  $p = .2009$ .

Table 5

ANOVA Table (Comparison Students at Pre and Post-intervention)

Source	DF	SS	MS	F	P Value
Between	27	1.688	.063	23.863	.0001
Within	84	.22	.003		
treatments	3	.012	.004	1.579	.2009*
residual	81	.208	.003		
Total	111	1.908			

\*  $p > .05$ .

Visual Analysis - Hypotheses 1, 2, and 3

The analyses of data presented to this point provide statistical tests and rationale for accepting or rejecting the hypotheses generated through this study. It is also possible to construct a visual representation of the effects of treatment on the reduction of inappropriate behavior, and



to depict the relationship between treatment and comparison groups as illustrated in Figure 1.

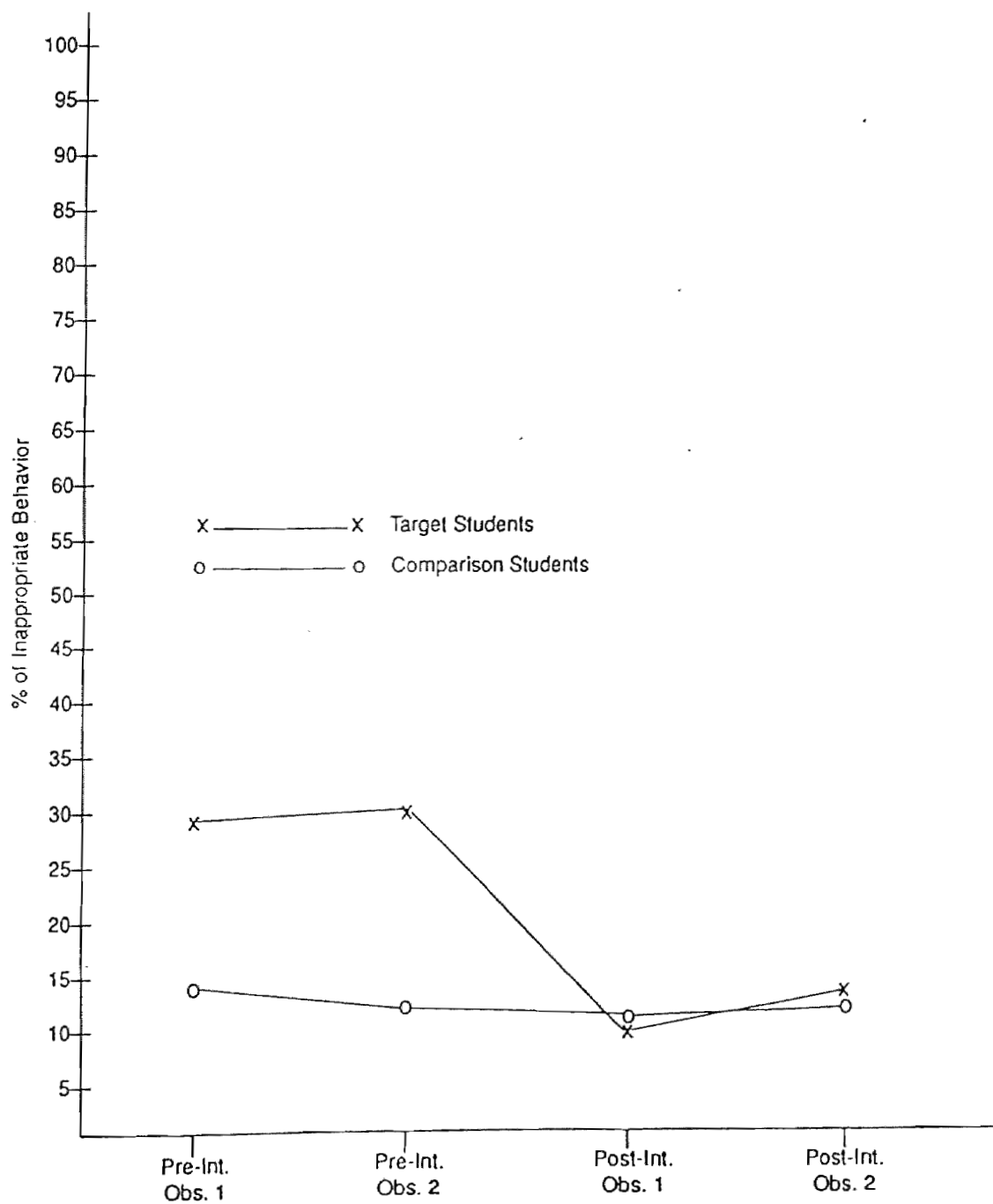


Figure 1. Pre and post-intervention observation scores for target and comparison groups.

## Chapter 5

### SUMMARY, CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS

The purpose of this chapter is to provide a summary of the research results, to draw conclusions from the data, to discuss and interpret factors associated with the results, to identify limitations, to offer recommendations for future research, and to offer recommendations for practitioners within the field of education.

#### Summary, Conclusions, and Discussion

In this section, the results are summarized by hypothesis and an in-depth interpretation of the data will be developed.

#### Hypothesis 1 - Summary

As hypothesized, the level of inappropriate behavior of target students (those being considered for special education evaluation) was significantly greater than the level of inappropriate behavior of paired or comparison students (gender matched, but otherwise randomly selected peers) at pre-intervention.

#### Hypothesis 2 - Summary

Hypothesis 2 predicted that the level of inappropriate behavior of target students would be the same as the level

of inappropriate behavior of paired students at post-intervention. Although no statistically significant differences were identified between target and paired students, the investigator was unable to statistically validate that the two groups were actually the same at post-intervention. Thus, while the likelihood of differences between the groups is small, the statistical analysis did not verify that they were actually the same.

### Hypothesis 3 - Summary

As hypothesized, the level of inappropriate behavior of target students decreased as a function of prereferral interventions. Of the 14 target students, 9 met or exceeded the behavior goals designed by their teacher and MAT consultant, and 4 reduced their level of inappropriate behavior to a degree where it was noticeable by their classroom teacher. Only 1 of the 14 target students failed to demonstrate a notable reduction in inappropriate behavior as a result of the MAT intervention.

### Interpretation of the Data

This project examined whether consultants using the MAT could effectively assist teachers in remediating inappropriate behavior in the mainstreamed classroom environment for students being considered for special education referral. Within the sample of students comprising the project, two of the original three hypotheses were

upheld. The study demonstrated that: (a) the level of inappropriate behavior of students being considered for special education was greater than their comparative counterparts from the same classroom at pre-intervention; and (b) the level of inappropriate behavior of students being considered for special education was reduced through application of the MAT within the regular classroom environment.

The MAT provides a structured behaviorally based method of assisting consultants in intervening in cases in which students demonstrate problem social behaviors (interval monitoring) and/or in cases in which students demonstrate poor work orientation (product monitoring). While no effort was made as part of this study to differentiate between MAT effectiveness in remediating problem social behaviors and poor work orientation, it is worth noting that, of the 14 target students, 9 treatment interventions were designed to remediate problem social behaviors and 5 treatment interventions were designed to remediate difficulties with work orientation.

This could suggest that the behavioral orientation of the MAT more readily lends itself towards intervention with observable behavioral difficulties than with the more transparent issues of product completion. Recall that, Fuchs et al. (1989) defined problem social behaviors as behaviors which (a) interfere with the teacher's ability to

conduct class normally, and/or (b) interfere with other students' ability to work. They defined poor work orientation as poor work habits which interfere with the performance of an otherwise capable student (e.g., failure to start or complete work, distractibility, doodling). In the present study, it may have been easier for the consultants to accurately identify problems and intervene in cases where incidences of inappropriate behavior were readily observable (problem social behaviors) than in cases where some inference had to be made between what was behaviorally observable and the acceptable production of classroom work (poor work orientation). Conversely, it may have been possible that the consultants in this study were simply more comfortable with applying the techniques of the MAT towards remediation of problem social behaviors than applying the techniques towards improved work completion, or that the sample of students which comprised this study simply demonstrated more problems with social behaviors than work orientation.

It is also worth noting that target levels were met or exceeded in five of the nine attempts to remediate problem social behaviors. In three other cases, inappropriate behavior was reduced to a degree where it was noticeable by their classroom teacher. In only one case was no appropriate change evident as a result of the MAT intervention. A follow-up conversation with the teacher of that child

indicated that the lack of intervention success may have resulted from an attention deficit hyperactive disorder which was diagnosed subsequent to the MAT intervention.

Four out of the five attempts to remediate poor work orientation netted positive results. Inappropriate behaviors were reduced to target levels and corresponding improvements in work completion and/or accuracy were noted in all but one case. In that case, inappropriate behavior was reduced to a degree where it was noticeable to the classroom teacher, but not to a degree where the teacher believed that further investigation of special education services was unwarranted.

Target students were predominantly male (10 out of 14), rather than female (4 out of 14) which is consistent with the disproportionate ratio of males to females who receive special education services (U.S. Department of Education, 1992). Of the 10 males, 7 met or exceeded target reductions of inappropriate behavior, 2 reduced inappropriate behavior to a degree where it was noticeable by their teacher, and 1 demonstrated no notable behavioral change. Of the 4 females, 2 met or exceeded target reductions of inappropriate behavior, and 2 reduced inappropriate behavior to a degree where it was noticeable by their teacher.

While the project did not specifically undertake the task of differentiating treatment gains between boys and girls, it appears that the MAT may be equally effective across genders. However, the over-representation of males as target students may provide further clarification for why 9 of the 14 target interventions focused on reduction of problem social behaviors. Given that boys are referred for special education more often than girls and given that boys are more often identified as manifesting behavioral problems (U.S. Department of Education, 1984, 1991, 1992), it would seem consistent that: (a) most of the referrals would be for problems manifested by boys; and (b) many, if not most, of the referral problems would be for problem social behaviors.

The MAT is designed to provide for four structured interactions between the MAT consultant and the referring teacher. The first meeting occurs prior to any intervention and is designed to identify the presenting problem. The second meeting follows pre-intervention observations and is structured to validate the problem and to plan the intervention. Meeting number three provides an opportunity for the teacher and consultant to review the pre- and post-intervention observational data and to evaluate the effectiveness of the intervention. The final meeting is to be held if the original behavioral goals have not been

attained and the teacher wishes to explore additional intervention options.

On the average, MAT consultants in this project spent 1 hour and 33 minutes meeting with teachers to identify problems, structure interventions, and evaluate behavioral gains. This is noticeably less than Fuchs et. al (1989) who estimated that consultants would spend approximately 6 hours per student designing and implementing MAT interventions. The briefer amount of time consultants spent in this project is probably due to two factors: (a) data on the time consultants spent on the project was only kept on the formal structured meetings between the consultants and teachers and did not include the amount of time spent on student observations and classroom visitations, and (b) in no case in the present study did teachers and consultants follow up through the fourth meeting as allowed by the MAT. In fact, it could be presumed that at least some of the students who demonstrated progress through the MAT might have reached their target behavioral goals had the teachers and consultants pursued additional interventions.

It is interesting to note that the consultants and teachers spent an average of 2 hours and 1 minute interacting on behalf of the four students who demonstrated sufficient behavioral progress to be noticed by their teacher, but who did not meet their target behavioral goals, yet only an average of 1 hour and 21 minutes for the nine



students who met or exceeded target behavioral expectations. This could suggest that student problems were more complex in some cases, which may have contributed to the failure to realize predetermined behavioral goals. The sole exception to this pattern was the amount of time (1 hour and 25 minutes) spent on behalf of the one student who demonstrated no notable progress.

The possibility that student problems were more complex in some cases was further supported by teacher perceptions regarding the need for specialized assistance. During the problem identification stage of the MAT (meeting 1), teachers were asked to rate on a 5-point Likert Scale how appropriate it would be "to refer the target child for some type of specialized professional help, such as placement in special education, counseling provided by a school psychologist or guidance counselor, or a comprehensive assessment at a nearby hospital or clinic?" A rating of 1 was defined as very appropriate and a rating of 5 was defined as inappropriate. Teachers were asked the same question at the post-intervention evaluation (meeting 3). For the nine students who met or exceeded behavioral goals, teacher ratings changed from a mean of 2.2 at pre-intervention to a mean of 4.33 at post-intervention, perhaps indicating that, in the judgment of the teachers, the successes of the interventions were sufficient to preclude the need for more intensive assistance. Conversely, in the

four cases in which progress was notable, but behavioral goals were not attained, the mean ratings at post-intervention changed very little from the mean ratings at pre-intervention. In these cases, the mean teacher rating at pre-intervention was 1.25 and the mean teacher rating at post-intervention was 1.4.

Thus, while it does not appear as though the notable progress of students was sufficient in and of itself to dissuade teachers from their belief in the necessity of pursuing more intensive assistance, it can again be argued that those students who made progress, but did not attain behavioral objectives, may have presented more complex behavioral problems than those students who reached or exceeded their target behavioral goals. In fact, teachers identified a greater appropriateness for seeking additional specialized help at pre-intervention for these students ( $\bar{M} = 1.25$ ) than for students who reached or exceeded target behavioral goals ( $\bar{M} = 2.2$ ). Coupled with the fact that consultants and teachers spent an average of 49.4% more time analyzing the problems and designing the interventions for these students ( $\bar{M} = 2$  hrs., 1 min.) than for the students who reached, or exceeded behavioral goals ( $\bar{M} = 1$  hr., 21 min.), it does not seem surprising that they did not wish to pursue additional interventions prior to making a formal referral for special education assistance.

Consultants and teachers spent an average of 1 hour and 45 minutes when developing interventions designed to remediate problems clustering around work orientation and an average of 1 hour and 26 minutes when addressing problem social behaviors. This may be explained, in part, by the additional requirement of analyzing work samples as well as identifying behavior problems when addressing work orientation issues. It may also be due to the behavioral orientation of the school psychologists who served as consultants in this project. Having worked closely with over 70 school psychologists over the past 15 years, it has certainly been the author's experience that the training orientation for school psychologists has traditionally focused more on the remediation of behavioral difficulties than on the curricular issues which impact successful work production.

While determination of the degree of consultant training for MAT success was not a part of the empirical design, it appears as though very little additional training on the MAT may be necessary for effective consultation, provided the consultant has had sufficient prior training and/or experience in methods of behavioral consultation. Only 3 hours and 45 minutes of instruction on the MAT was provided as part of the research design, which also included instruction on the additional data collection techniques required of this project. This is in marked contrast to

Fuchs and Fuchs (1989) who provided 14 hours of training over a two-day period. It suggests that the MAT may be sufficiently operationalized for easy implementation by appropriately trained behaviorally based consultants.

The additional training provided by Fuchs and Fuchs (1989) may have been required because of greater variability in their selection of consultants. In contrast to the present study, in which only school psychologists were selected as consultants, Fuchs and Fuchs (1989) used five special education resource room teachers, two school psychologists, and three pupil personnel specialists as consultants.

In fact, one of the keys to the success of the MAT may lie in the selection of consultants. In this project, school psychologists were chosen because of the generalized skills in behavioral consultation they were capable of bringing into the school setting. In selecting consultants it seemed apparent that, given the proper building climate, most school psychologists have sufficient background training and skills to effectively consult within a school setting. This, however, has not been empirically validated, nor was it validated as part of this study. In fact, very little attention has been devoted to the effect of professional orientation on the outcomes of classroom based interventions. While Graden, Casey, and Bonstrom (1985) demonstrated that school psychologists were more effective

than special education resource teachers in reducing the number of students placed into special education, other researchers, (e.g., Bahr et al., 1988; Fuchs & Fuchs, 1989; Fuchs et al., 1990) reported no discernible differences between the effectiveness of consultants as a result of specific training orientation.

In addition, in the present study, it was certainly possible that there was an interaction effect between the training, experience, and predisposition of selected consultants and the additional training and support specific to implementation of the MAT. Previous efforts, Bahr et al. (1988), Fuchs and Fuchs (1989), and Fuchs et al. (1990), built in extensive training and support to field consultants, whether they were school psychologists, special education resource teachers, or pupil personnel specialists. In this study, actual training and support for the MAT was limited to the 3 hours and 45 minutes as previously mentioned. Without providing more extensive training on the underlying behavioral principles of the MAT, it is possible that the success in effecting student behavioral change may not have occurred had consultants other than school psychologists been used as a part of the project.

### Limitations

This section addresses selected factors in the research design which may reduce its validity, or its generalizability to mainstream American education.

### Regression Effects

No methodological or statistical controls were undertaken to account for regression effects. However, given the consistency of measures for target students at pre-intervention (#1 -  $\bar{M}$  = 29.71 and #2 -  $\bar{M}$  = 30.0), and the consistency of measures at post-intervention (#1 -  $\bar{M}$  = 10.3 and #2 -  $\bar{M}$  = 13.5), it is unlikely that regression played a major role in the reduction of inappropriate behavior. This is further validated by the consistency of measures for comparison students at pre-intervention (#1 -  $\bar{M}$  = 14.0 and #2 -  $\bar{M}$  = 12.1) and at post-intervention (#1 -  $\bar{M}$  = 11.2 and #2 -  $\bar{M}$  = 11.9).

### Instrumentation, Testing, and History Effects

Because of the efforts undertaken to validate the integrity of the treatment and the accuracy of dependent measures, it is unlikely that instrumentation, testing, or history effects compromised the internal validity of the study. However, since expectancy effects were not controlled for through the research design, the reader is cautioned about the increased possibility of a Type-1 error. While

teachers and parents were cautioned not to inform participating students that they were being observed, the research design did not permit an analysis of whether students may have behaved differently in the presence of the observer(s), or if teachers' behaviors toward the participating students may have changed due to the presence of the observer(s).

Instrumentation. As per MAT protocol, the consulting school psychologist visited the classroom on at least two occasions to ensure that the prescribed interventions were implemented as designed. Teachers independently implemented 91% of the design components for which they were responsible, and with minimal assistance from the consultants, accurately implemented 100% of the components of their assigned responsibility. Students independently implemented 68% of the design components for which they were responsible, and with minimal assistance from the consultants, accurately implemented 100% of the components of their assigned responsibility.

Participating school psychologists were instructed in methods of defining behaviors in discrete operational units and in accurately observing and recording behaviors. Based on these operationally defined behavioral units, all students (target and comparison) were observed on two

different days at pre-intervention and on two different days at post-intervention. Eight additional school psychologists were also instructed in observing and recording behaviors and served as independent observers. These independent observers, blind to the identity of the target students, were used to corroborate behavioral observations in 16 of the 56 total observations, resulting in a mean inter-observer agreement of 94.18% at pre-intervention and 97.78% at post-intervention.

Testing. As part of the research design, the consulting school psychologists were obligated to ensure that target students understood and were capable of performing all of the treatment components which were designed to be student driven. This required an interaction between the consultants and target students which may have created an effect that influenced the dependent variable. Having interacted with the consultants on behavioral issues, it is possible that target students behaved differently in their presence (post-intervention observations), than they would have otherwise. However, given that this component of the research design was consistent with the treatment protocol of the MAT, and given that the ultimate objective of the treatment was reduction of inappropriate behavior, the implications of these effects seem negligible.



History. As part of their training on the gathering of data for this project, participating school psychologists were instructed not to engage in other collaborative, or direct treatment interactions with the teachers, or target students participating in this project. In addition, they were instructed to disqualify students from serving as comparison students if they were later referred for assistance. While it was possible that uncontrolled variables had an impact, the likelihood was small. The fact that inappropriate behaviors had not been satisfactorily reduced through independent teacher efforts prior to implementation of the MAT builds a case that concomitant treatment effects were unlikely.

Of greater concern was the frequency of observations. While all observers were instructed to be discreet and unobtrusive, it is possible that the frequent intrusions into the classroom could have had an effect on the behavior of target students. The possibility of expectancy effects cannot be discounted in the interpretation of the data.

#### Student Sample

The size of the sample was small. While it was possible to statistically demonstrate effectiveness of treatment in reducing inappropriate behaviors, the MAT was used with only 14 students. It is debatable whether such a

small sample size constitutes a representative sample of all students who might be referred for special education.

Also, by design, some exceptions when considering whether to use the MAT were allowed. If it was mutually agreed upon by the teacher and consultant that if: (a) the presenting problem was not primarily learning or behaviorally oriented (e.g., voice articulation); or (b) the problem warranted more significant intervention (e.g., significant mental impairment), then the consultant had the option to move directly to referral for special education. While no students were actually excluded from the study because of this, the results cannot be generalized to all students who may be under consideration for special education. Clearly, the types of problems which were encountered were not representative of all of the problems addressed through special education.

### Consultants

School psychologists were chosen as teacher consultants in this project. In so doing, it was presumed that they had already sufficiently mastered behavioral consultation skills as part of their graduate training and field based experience. Additional training was limited (3 hours and 45 minutes), and focused on the nuances of the MAT and data collection methods required of this experiment. One of the factors used in selecting which schools would

participate in the project was the level of experience of the school psychologist assigned to a particular building. The investigator believed that too little field experience could have rendered the school psychologist ineffective as a consultant. The investigator also believed that it would be difficult to convince veteran school psychologists with many years of experience that a cookbook method of consultation such as the MAT would enhance the delivery of school psychological services. Consequently, selection of consultants was limited to willing participants with three to five years field experience as a school psychologist.

Because of the selection of school psychologists as consultants, the reader is again cautioned from overgeneralizing. The training required for certification as a school psychologist varies from state to state and from one training institution to another. Likewise, the natural attributes individuals possess may affect their ability to function successfully as consultants.

Conversely, one of the strengths of the MAT is the structure it builds into consultative interactions. The formula driven, cookbook approach it requires may have assisted in minimizing the variability in effectiveness from one consultant to the next.

### Target Schools

Due to local demographics, three rural midwestern elementary schools were chosen to participate in the project. All schools were rural in nature, with populations falling within a range of approximately 300 to 600 Average Daily Membership (ADM). Students and faculty were predominantly Caucasian. Because of the demographic characteristics of these schools, any generalizations to schools of larger size, differing demographics, and/or from other regions of the country should be undertaken very judiciously.

In addition, one of the factors in determining whether a school was selected was the support of the building principal. Principals of all selected schools were willing to work with their respective faculties in supporting changes in the flow of referrals to the school psychologist. They were also willing to support the assigned school psychologist when some teachers resisted the retreat from a traditional refer, test, and place model of school psychological services. While the strong level of support was advantageous for MAT implementation, it may have created a skewed sample which is not representative of most elementary school buildings.

### Social Validation

While not specifically a part of the research design, informal visits with a number of teachers, building principals and the school psychologists who participated in the project uncovered very little interest in building upon the successes of the MAT beyond the limits of this project. Even though 9 of the 14 students who received intervention assistance reduced inappropriate behavior to the target level, and 4 more reduced inappropriate behavior to a degree where the classroom teacher agreed the intervention had a positive effect, only a handful of participants expressed an interest in continuing into the next school year. This could suggest a significant limitation in adoption of the MAT as a broad based intervention methodology and illuminates a notable limitation in the design of the present project, i.e, no systematic attempt was undertaken to socially validate the MAT as a treatment methodology (Wolf, 1978).

If the research to date has accurately reflected the core components of behaviorally based consultation, and the MAT actually does require a minimal effort on the part of teachers, the reluctance of project participants to move forward would seem to exemplify Witt's (1986) concern when he questioned why so many teachers resisted the use of classroom prereferral interventions. He argued that the effectiveness of interventions was only one of a number of considerations in teacher satisfaction. He further argued

that the teacher's perception of the likely effectiveness of an intervention is more likely to lead to implementation than any particular data supporting the intervention.

#### Treatment and Control Groups

While it was evident that target students demonstrated a statistically significant reduction in inappropriate behaviors, it cannot be said with certainty that the reduction was a result of the MAT. The fact that target students were compared only to a control group and not to other groups using treatment techniques different from the MAT limits the conclusions which can be drawn from this effort. It is possible that the reduction in inappropriate behaviors may have resulted solely from the additional attention target students received through their participation in this study, and not as a factor of the MAT.

#### Implications

All limitations and constraints notwithstanding, it appears as though proper application of the MAT can significantly reduce inappropriate behaviors in the mainstream classroom setting. From a practical standpoint, Fuchs et al. (1989) have produced a behaviorally based consultation manual designed to assist consultants in effectively working with teachers to remediate learning and/or behavioral problems without relying on special education services.

Given the previously identified concerns, i.e.:

(a) the educational community's failure to meet the intent of P.L. 94-142 (Comptroller General of the United States, 1981), (b) the increasing numbers of individuals with mild disabilities (U.S. Department of Education, 1984, 1991, 1992), (c) the high cost of special education (Chaikind et al., 1993), (d) the lack of objectivity in determining which students are eligible for special education (e.g., Algozzine & Yssledyke, 1981; Algozzine et al., 1983), and (e) the general ineffectiveness of special education (Carlberg & Kavale, 1980), it would seem that adoption of any empirically validated instrument or technique which results in positive behavioral change within the regular classroom environment would be advantageous. The MAT may prove to be such an instrument.

### Recommendations

In this section, recommendations are made for further research and for practical application of the MAT.

### Recommendations for Further Research

In reviewing the literature on prereferral interventions, empirical support for the effectiveness of the Mainstream Assistance Team Model (Bahr et al., 1988; Fuchs et al., 1989; Fuchs, 1991; Fuchs et al., 1990) as a process for reducing inappropriate classroom behaviors in the mainstream setting was noted. While the principles of

behavioral consultation underlying the construction of the MAT have a solid empirical foundation (Bahr et al., 1988; Bergan, 1977; Fuchs & Fuchs, 1989; Fuchs, 1991; Fuchs et al., 1990), actual field research on the MAT, as an operational manual, did not exist prior to this project. Prior to this project, the research which predicated the development of the MAT narrowly defined the method of selecting pupils for treatment consideration. As such, until now, no attempt had been made to empirically validate whether the MAT, per se, is an effective tool in reducing inappropriate behaviors, or whether its underlying behaviorally based principles have generalized applicability for any student who may be under consideration for referral to special education.

While this effort has contributed to a broader understanding of the usefulness of the MAT as an operational manual, and has attempted to broaden its test of applicability to any student who may be under consideration for special education referral--with exceptions as previously noted--additional efforts are necessary to further substantiate the effectiveness of the MAT. While the effect of interventions on 14 students were encouraging, the results are insufficient to draw definitive conclusions. Broader based studies which encompass more diversified samples would lead to a more comprehensive understanding of the impact of the MAT as a field instrument.



Likewise, it is difficult to generalize beyond small rural midwestern schools from the scope of this study. The sampling demographics of the present effort may differ remarkably from mainstream American education. Most small schools maintain some sense of family, or community which may not be evident in more metropolitan areas.

Although, with minimal exceptions, this study was designed to provide assistance to any student who would potentially be referred for special education, the sample size was small enough that it could not be possible to have tapped the scope of problems which cause teachers to pursue assistance through special education. While Fuchs et al. (1989) make no claim that the MAT will be universally effective, the range and types of problems amenable to MAT have not been adequately explored. The educational community could benefit from additional data which would delineate the specific problems which can be successfully addressed by the MAT. For example, this study made no attempt to determine whether the MAT is more effective in addressing problem social behaviors, or in addressing work oriented problems.

A longitudinal analysis would also be beneficial. At this point very little data exists to assist in determining whether gains from MAT interventions are sustainable over time. One of the standard critiques heard by the author is that prereferral interventions only forestall inevitable

placement in special education. The educational community needs concrete data which will validate whether interventions have a desired positive long range effect.

A better understanding of what constitutes an effective cadre of skills for implementation of the MAT would be helpful. Given the enormous cost of special education (Chaikind et al., 1993), the recommendation for more extensive use of classroom based interventions (e.g., Bahr et al., 1988; Carter & Sugai, 1989; Fuchs, 1991) and the educational community's generalized lack of success in effectively using prereferral interventions to minimize the need for special education (Flugum & Reschly, 1992), it would be instructive to validate the prerequisite skills for successful application of the MAT.

Perhaps most importantly, the educational community would benefit from more in-depth studies of teacher attitudes towards prereferral interventions. If it can be demonstrated that behaviorally based consultative techniques are effective in remediating problems in the mainstream environment, and likewise be demonstrated that the interventions can be implemented with only minimal commitment and effort from the teacher, the fundamental question of why teachers are reluctant to participate in the system must be addressed. Any empirical data which will assist in isolating the variables which drive teachers to reject a system which seems to be effective can help create

the proper context for allaying their concerns. Only after a better understanding of what motivates teachers to willingly work within the context of prereferral interventions is gained is there any reasonable hope of creating real systemic change within the field of special education.

### Recommendations for Practitioners

While it can be inferred from this study that the MAT presents an operational package with the propensity of reducing inappropriate behaviors within the mainstream classroom environment, from a practical standpoint, prospective users of the MAT must consider what constitutes:

- (a) an appropriate selection of consultants and their related training, and perhaps even more importantly
- (b) teacher attitudes towards prereferral interventions.

In addition, the support of the building administrator would seem to be an important variable in the overall success of the MAT in reducing the reliance on special education as a specific intervention technique for students experiencing difficulties within the classroom.

When selecting MAT consultants, it would seem important to consider individual levels of expertise in principles of applied behavioral analysis. This is particularly true because of the lack of data regarding the degree of specific training required of MAT users for

successful implementation. At this point, the literature has not specifically isolated the degree of treatment variability due to training and support requirements. For example, consultants in this project received only 3 hours and 45 minutes of training and were given no opportunity for support through trained users of the MAT. Conversely, Fuchs and Fuchs (1989) provided consultants with 14 hours of exclusive training on the MAT and with ready access to the university support and to the developers of the MAT. Successful student outcomes were evident across both projects. However, given the lack of empirical validation regarding the optimal training and support components of the MAT, it would seem reasonable to err on the side of caution in training and assigning MAT consultants. At this point, it would seem most efficacious to look towards the school psychology community as the group with the most optimal background training in the behavioral techniques required of the MAT. It would also seem reasonable to provide more than the 3 hours and 45 minutes of training on the MAT which was provided as part of this project.

Given the apparent lack of desire of project participants to build upon their successes, it would seem imperative that prospective users of the MAT undertake extensive efforts to build a long term commitment to pre-referral intervention techniques as part of the normal course of activity within their respective assignments.

This could probably best be accomplished through comprehensive staff development efforts, which should be undertaken only after developing a detailed understanding of the potential impacts on teachers and special education support staff within a given building or school district.

Lastly, commitment from the building administrator would seem to be critical to the long term success of any change effort considering the use of the MAT as a classroom-based intervention technique. It would seem as though any systemic change initiative, especially one designed to moderate the type and degree of special education involvement in the remediation of behavioral and learning problems, would necessitate the establishment of a supporting building climate wherein teachers, parents, and support staff feel at liberty to undertake the risks inherent in constructing more systematic ways of intervening on the behalf of students.

#### General Conclusions

The evidence generated from this study supports the use of highly structured behaviorally based interventions to assist the educational community in successfully remediating learning and/or behavioral concerns in the regular classroom environment. In addition, the conclusions of this study have added to an empirical knowledge base in substantiating the viability of the MAT as an operational field instrument.

Numerous questions concerning the selection of appropriate consultants and the impact of their related training have been raised, along with the issue of attitude on the ultimate impact of behaviorally based interventions within the mainstream setting. Lastly, a set of recommendations for building upon this work and the work of others has been offered to further assist educators in constructing a solid empirical foundation for exploring alternative methods of working with students who might otherwise require special education services.

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Appendix A  
BUILDING PERMISSION FORM

School District Letterhead

December 15, 1993

Jerry Stremel  
Director of Special Education  
Hiawatha Valley Education District  
1410 Bundy Blvd.  
Winona, Minnesota 55987

Dear Mr. Stremel:

Thank you for considering our school as a site to implement the Mainstream Assistance Team project. As we discussed, I understand that the project is designed to provide immediate assistance to teachers should student learning and/or behavioral problems arise in the classroom. I also understand that, for the duration of the project, our school psychologist will intervene directly with classroom teachers requesting assistance.

You have my support and encouragement to proceed with the project.

Sincerely,

Building Principal

## Appendix B

## MEMO TO BUILDING TEACHERS AND SUPPORT STAFF

Letterhead

School District

## Memorandum

TO: Building Teachers & Support Staff  
FROM: \_\_\_\_\_, Principal & Jerry Stremel, Director  
of Sp. Ed.  
DATE: December 15, 1993

RE: HVED Pilot Project

Our school has been selected as one of three elementary buildings to participate in a project entitled the Mainstream Assistance Team. This project is designed to provide more immediate assistance to classroom teachers should learning and/or behavioral problems arise in the classroom.

During the period from January 1, 1994 through May 31, 1994, we are asking that you refer any ongoing student based concerns which appear to be learning and/or behaviorally based directly to the school psychologist. She will work directly with you in identifying the problem and attempting interventions within the classroom.

## Appendix C

## INFORMED PARENTAL CONSENT

School District Letterhead

December 15, 1993

Dear Parent(s),

During the spring semester, our school will participate in a study designed to help teachers work more effectively with all children. During this time, our school psychologist, \_\_\_\_\_ will be visiting classrooms on a regular basis. She will be observing children and working directly with teachers to design positive experiences for children experiencing learning and/or behavioral difficulties. In some cases, she will record children's behavior to help us understand how to create the best possible learning environment for all children.

The benefits to your child and to other children will be that the best arrangements will be used to help them learn. Participating children will not encounter risks any greater than those in daily life. The results will be completely confidential. Your child's name will not be used in any report.

If you wish, you may choose not to allow your child to participate in this study. If you do not wish to have your child participate, his/her program will not be affected in any way. Also, if you choose for your child to participate, you may withdraw this consent at any time.

If you have questions, please contact my office, or contact Jerry Stremel at 452-1200.

Sincerely,

Building Principal

-----  
Please return this form to your child's teacher as soon as possible.

\_\_\_ YES I agree to allow my child \_\_\_\_\_ to participate in the study described above.

\_\_\_ NO I do not wish for my child \_\_\_\_\_ to participate in the study described above.

\_\_\_\_\_  
(Parent's Name - Printed)

\_\_\_\_\_  
(Parent's Name - Signed)

\_\_\_\_\_  
(Date)

## Appendix D

## INFORMED PARENTAL CONSENT - PROJECT DETAIL FORM

Dear Parent(s):

As described on the enclosed form, we are asking your permission to allow your child to participate in a study designed to help teachers work more effectively with the children in their classrooms. Before granting your permission, it is important for you to know more about what the study will mean for your child. Children will be selected for participation in this study in two ways:

1. Some children experience difficulty learning without special modifications in the classroom. Other children demonstrate behavioral problems. This study is designed to allow your child's teacher to work more closely with the school psychologist in designing modifications which will assist children in learning, or improving their behavior at school.

If your child is experiencing learning or behavioral problems at school, we are asking your permission to allow the school psychologist to observe his or her behavior in the classroom. The school psychologist will then work directly with the teacher to develop appropriate modifications to help your child succeed. All modifications will be positive and will focus on reinforcing your child for appropriate behaviors and/or completion of school work.

If you allow your child to receive help in this manner, the school psychologist and/or classroom teacher will contact you regarding your child's progress in approximately six weeks.

2. In order to understand whether our efforts at improving learning and behavior at school are successful, it is important that we also observe children who are not experiencing any particular problems. These children will be picked at random.

If you have not already been contacted by the school regarding any difficulties your child is experiencing, we are asking your permission to allow the school psychologist to observe your child to help us evaluate our efforts in working with other children. In this case, the school psychologist will observe and record your child's behavior, but will not work with the teacher to design classroom modifications specific to your child.

Please note that the results of the study will be completely confidential. Your child's name will not be used in any report.

When completed, results of the study will be shared with interested persons. If you would like to receive a written summary of the results, please contact me directly at (507) 452-1200.

Sincerely,

Jerry Stremel, Project Coordinator